ELECTRICAL REVIEW

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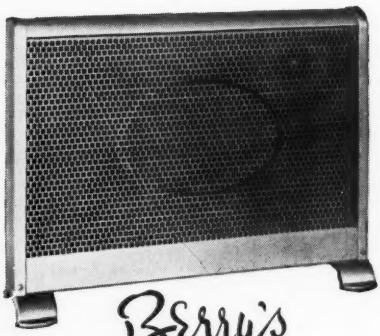

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ELECTRICAL REVIEW

1st MAY, 1953

THE OLDEST ELECTRICAL PAPER • ESTABLISHED 1872 • VOL. CLII • NO. 18

Boiler Availability

AS a distinctive feature of modern power stations, the reduction in the number of boilers in relation to turbines installed is pre-eminent. Within the last few years the need to take boilers out of commission at relatively frequent intervals, on account of the fouling of gas passages and corrosion of metal surfaces, has been very materially lessened. For this improvement much credit must be given to the work of the Boiler Availability Committee and co-operating research organizations.

Started in the early years of the last war with the immediate object of securing greater continuity of service and full rated outputs of boilers, the Committee has since then increased its scope to include long-term investigations into aspects of fundamental sciences related to combustion, many of which are still incompletely understood. Such further investigations have not only facilitated the task of coping with deposits and acid effects on the exterior surfaces of existing boilers but have also provided valuable data for the design of units of more advanced designs included in the programmes of the British Electricity Authority, which has co-operated to its own advantage by providing the means whereby tests can be carried out under actual operating conditions over many months. The importance of this procedure is that the operating performance of boilers, much more than that of the generality of plant items, depends upon local circumstances, including the constituents of the fuel available and its consistency, which in the light of present knowledge cannot always be provided for in the design stages.

A promising development of these activities is the formation of working groups for dealing with specialized questions in individual cases. While many problems are being solved empirically, the underlying reasons for them, a fuller co-ordinated knowledge of which would give the coherence requisite for the formulation of generally applicable theories, are often obscure. The observed phenomena are referred to laboratories, where they are being

worked out as long-term research projects. Pulverized fuel firing appears to carry immunity from some of the most troublesome deposits and is being adopted for the larger boilers in new power stations This trend, however, furnishes no valid reasons for any relaxation of effort, since the move towards higher steam temperatures of itself raises a number of questions that call for answers in the economic sense. The success achieved so far has made the unit one-boiler one-turbine system a feasible reality, coupled with reliability in service, which is worth paying for.

RESPONSIBILITY

Lord Citrine, chairman of the British Electricity Authority, told the Select Committee on Nationalized Industries last year that one of the greatest difficulties in a big organization was to get people to accept responsibility. The point is taken up in the April *Electrical Power Engineer* where it is contended that such an attitude is engendered by the desire for standardization of method which often removes individual initiative and authority. But centralization should be kept within limits by those concerned refusing to become " nerve-racked " by the occasional anomaly and applying the principle of " on the job " consultation to the executive technical staff. It is considered unfair to blame the rank and file engineer who is " no different in spirit, intelligence and determination from his father and grandfather who built up the electricity supply industry of this country."

CABLE CHANGES

A revised version of B.S. 7 : 1946 for rubber insulated cables and flexible cords for power and lighting purposes is expected to be issued this summer; with it there will be issued a new B.S. for p.v.c. insulated cables for generally similar purposes that will supersede the supplement previously included in B.S. 7. The new documents will differ from the original in a number of respects: the most important of the consequential changes, which will all result in reductions, will concern the thickness of insulation for the 250 V cable, and the adoption of more rational sheath thicknesses. The modifications are supported by the C.M.A. because extensive experiments by members of the Rubber and Thermoplastic Cable Manufacturers' Association have resulted in the production of improved materials, particularly rubber mixes, and better manufacturing methods. The new types of cable and other changes in the specification also have the approval of the I.E.E., with certain exceptions which will be referred to in the specifications.

KELVIN'S DILEMMA

The great difference in intellectual approach towards fundamental research and its application makes it improbable that aptitude for both will be found in any one man at the same time. The question was posed in the I.E.E. Kelvin Lecture last week whether Lord Kelvin would more profitably have continued to devote his genius to investigations in pure science, in which he seems to have been on the verge of antedating both Maxwell and Hertz and to have been reaching a position comparable with that of Newton's. The turning aside of his powers to achieve more practical ends was of inestimable advantage to engineering. The question mark, however, remains.

FUEL TECHNOLOGISTS

The responsibility of fuel technologists for promoting economy in the use of coal—dwindling national capital—was emphasized by both the Minister of Fuel and Power and Dr. G. E. Foxwell, the president of the Institute of Fuel, at last week's annual luncheon. Unfortunately the number of qualified men now available is nothing like that required as a minimum. As reflected in the present Institute membership, " saturation " is less than 25 per cent and the need will undoubtedly grow.

Steelworks Extensions

Shotton Works Becomes Self-Contained

WE recently had the opportunity of making a conducted tour of the new plant being installed at the Shotton works of John Summers & Sons, Ltd., which was officially inaugurated by H.R.H. the Duke of Edinburgh on Wednesday last. In the *Electrical Review* of 2nd August, 20th September, 18th October and 15th November, 1946, we described the applications of electricity to steel slab production, hot strip rolling, cold strip rolling and the works electricity supply scheme, respectively, as they existed at that time. Then the output of the rolling mills was about half a million tons a year, based on outside supplies of pig iron and on the use of coal, pig iron and scrap in two open hearth furnaces, although the actual capacity of the rolling plant was at least one million tons per year.

When the Government instituted the five-year plan for the industry, to increase the national output of steel by three million tons, the natural development at Shotton was to install new steel-making furnaces which would line up with the capacity of the rolling plant and to support this move by providing blast furnaces for the supply of pig iron to the steel-making plant, particularly in view of the declining supplies of scrap throughout the world, and further to install coke oven plant for the provision of the essential supply of coke to the blast furnaces.

All this new development, which also includes new ore handling, coal handling, by-products and other plant, has resulted in an increase of the factory site area by about 280 acres, making a total site area of well over 500 acres on the reclaimed marshland on the banks of the River Dee where there is ample scope for further extensions which may become necessary.

The new No. 3 steel melting shop has replaced the old Nos. 1 and 2 melting shops which have now been dismantled, and it contains eight 150 ton fixed basic open hearth Salem Engineering furnaces. Not only are these new furnaces much larger than the old ones, but they are much more flexible in operation in that they can be fired either by oil, tar or coke oven gas according to the economic balance of the works in regard to the availability of the various fuels. Two 1,200 ton inactive hot metal mixers fed from the blast furnaces

constitute the main source of supply of raw material for the steel melting furnaces inside the melting shop.

The principal handling equipment in the melting shop includes four 8 ton Arrol-Morgan floor charging machines and two 125 ton and two 250 ton Wellman ladle cranes. All the cranes are electrically operated, and supplied by the overhead conductor sliding pick-up system. The supply scheme for the heavy cranes is 230 V d.c. which is taken from a central substation equipped with three 950 kW B.T.H. mercury arc rectifiers. Other large drives on the steel melting plant are the 100 h.p. waste heat boiler fan motors; these are variable speed commutator machines supplied by Laurence, Scott & Electromotors, Ltd.

There is an excellent system of automatic control and instrumentation by Tinsley (Industrial Instruments) associated with the melting plant, and the instruments include recorders for oil, steam and gas flow and temperatures, as well as differential indicators for pressures and temperatures. The operating switches for these are mounted on a desk.

Large Blast Furnaces

For the supply of the necessary quantity of pig iron two blast furnaces were envisaged and one of these is now in operation. This blast furnace, which was built by Head Wrightson & Co., Ltd., has a hearth diameter of 27ft, which is believed to be the largest comparable dimension for any blast furnace outside the U.S.A., and it has an output of about 8,000 tons of basic open hearth iron per day. It incorporates the McKee top, while associated with the installation is an Ashmore, Benson, Pease pig-iron casting machine, although the normal flow line operating procedure is to feed the hot metal direct to the inactive hot metal mixers serving the steel-making furnaces.

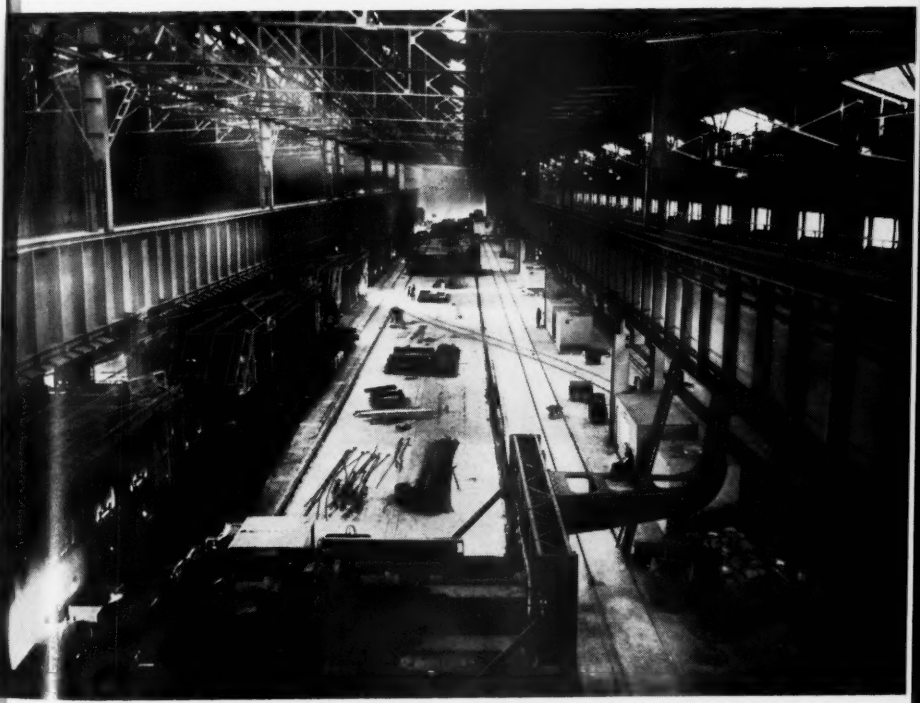
The principal electrical features of the blast furnace installation as a whole relate to the ore discharging, crushing and screening plant, to the ore bridge and to the furnace charging gear. The crushers are driven by two 300 h.p. high-torque s.c. Metrovick motors. The blast furnace charging scheme (Ashmore Benson) is fully automatic and operates on a sequence control scheme. The gas from the blast furnace is cleaned ready for its use elsewhere, and this is done firstly by taking the gas through mechanical dust catchers and finally through Metrovick electrostatic precipitators. Serving the precipitation plant there are two rectifiers of the synchronous rotating type and one metal rectifier, all of which operate at 80 kV.

To ensure the right quality and delivery at the correct times of coke to the blast furnaces a comprehensive coke oven plant has been installed, capable of carbonizing 11,000 tons of coal per week. It consists of two batteries of ovens, each with 44 Simon-Carves underjet ovens. The installation includes two complete sets of oven machines (pushers, guiders, etc.) which represent normal practice, except perhaps for the four-hopper charging car which is equipped with Locker-Traylor vibrating feeders which are designed to ensure an even flow of coal into the ovens. The oven capacity is to be increased to 88 ovens.

The coke oven installation includes an extensive coal handling plant, with a blending, stocking and reclaiming system in which the coal blending as distinct from iron ore blending is believed to be unique. The coke oven installation also embraces a by-products plant based on the semi-direct ammonia-recovery system. The principal uses of electricity in the coking plant generally pertain to the handling scheme, but for supplying the plant as a whole there are four substations, two for the coal handling section, one for the oven machinery and one for the by-products

The Shotton works site area is now well over 500 acres on the reclaimed marshland on the banks of the River Dee

The new No. 3 steel melting shop is equipped with eight 150 ton basic open hearth furnaces



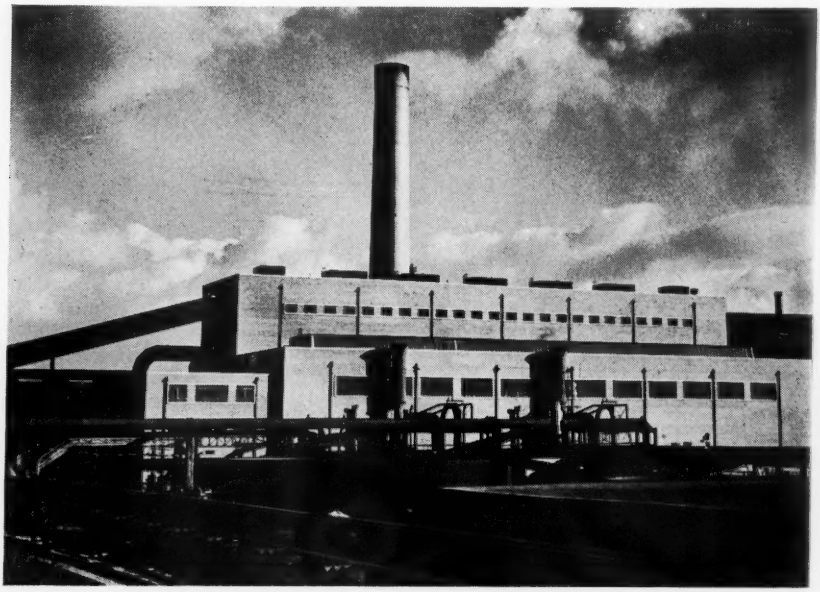
plant. Each substation is equipped with a 750 kVA transformer and on the low voltage side all these substations are interconnected in a ring to ensure continuity of supply. The main supply into this system is at 6·6 kV, duplicate 0·2 sq in cable feeders from the power station being installed for this purpose.

As a medium for utilizing the blast furnace gas and of balancing the heat flow in the works a new power station has been built. In it there are two 12,500 kW Parsons pass-out turbo-alternator sets generating at 6·6 kV, by which the generation of electricity constitutes a balancer to avoid the wastage of heat. The turbine room will also house three steam turbine driven blowers, two of which are already in operation. Each blower has a normal rating of 75,000 cu ft/min of air at 30 lb/sq in. The blower turbines are direct condensing, while the pass-out steam from the turbines of the turbo-alternator sets is at 160 lb/sq in. The boiler plant consists of three 85,000 lb/hr water-tube boilers which can be fired either by solid fuel or blast furnace gas, and two 90,000 lb plain gas fired boilers. The boiler steam conditions are 450 lb/sq in and 706 deg F. This new power station is interconnected at 6·6 kV with the older works power station described in the *Electrical Review* in 1946, and in turn the old power station runs in parallel with the public supply system. All the main distribution from the power station is effected at 6·6 kV through Reyrolle switchgear.

In the new power station all the 6·6 kV and 2·2 kV power cables and a considerable quantity of the low voltage cables, have been installed by British Insulated Callender's Construction Co., Ltd., using B.I.C.C. paper-insulated aluminium-sheathed and corrosion-proofed cables. A total of 26,700 yd of power cables and 11,960 yd of control cables has been supplied and installed, and in addition to this extensive use has been made of 7/·029 rubber-insulated cable in conduit for the lighting installation.

Distribution cabling from the power station to the new blast furnace and coke ovens involved the laying of 12,600 yd of p.i.l.s. s.w.a. and corrosion-proofed cables.

The new power station, which has been provided to balance the waste heat flow, runs in parallel with the older works station and the public supply



BIF 1953

Functions and Exhibits

LAST week-end saw the annual scramble by exhibitors to complete their displays in time for the opening of the British Industries Fair, but, as usual, practically all of the stands were ready by Monday. As we have already said, there is evidence at Castle Bromwich of a slight decline in the number of stands and the variety of exhibits but nevertheless the electrical display is again a very good one with quite a number of new and original ideas.

At the opening of the Castle Bromwich section of the British Industries Fair on Monday, the Lord Mayor of Birmingham, Alderman W. T. Bowen, with the Lady Mayoress, were received by officials of the Fair and entertained to lunch by the Fair Management Committee. The Lord Mayor proposed the toast of " The British Industries Fair " and the chairman of the Fair Management Committee, Sir Arthur J. G. Smout, J.P., responded. In addition to the Lord Mayor and Lady Mayoress the principal guests were the Yugoslav Ambassador, Dr. Vladimir Velebit, accompanied by his commercial counsellor Dr. Petar Tomic, and the Hon. J. M. Tully, agent general for New South Wales.

At the conclusion of the lunch the president of the Birmingham Chamber of Commerce, Mr. A. B. Waring, in inviting the Lord Mayor to declare the Fair open, said that the British Industries Fair was mainly a private enterprise and a success despite that fact. It had also benevolent Government patronage and the success was due in large measure to the support always received from the Lord Mayor of Birmingham and the City Council.

They were now faced with the knowledge that world competition continued to grow and they felt that this Fair was one of the answers to the problem of obtaining world markets and business. What was more important was that everything was available for quick delivery. It was a tribute to the exhibitors that in spite of full order books since the war they had maintained their interest and support in the B.I.F.

Declaring the Fair open, the Lord Mayor said that if we were to survive as a great industrial nation we had to tell the world what we had to offer and in doing so had to ensure that we could deliver goods of quality and at the right price.

At the *Electrical Review* stand members of the staff are available to answer inquiries

On behalf of the Electrical Exhibitors' Committee, the British Electrical Development Association has produced a 38-page booklet containing classified particulars of exhibits of electrical interest at Castle Bromwich.

Increasing Production

IN "Higher Industrial Production With Electricity," an excellent book published by the British Electrical Development Association since last year's British Industries Fair, appears the following: "The general conclusions to be drawn from an examination of statistics relating to electric power and productivity are that higher production inevitably involves greater use of electricity and more power at the worker's elbow, the cost being almost infinitesimal when compared with the value of the product."

So significant is this and many other supporting statements in the same book in the light of the trend of development which is reflected in the industrial exhibits at the Birmingham section of the B.I.F. again this year that we feel that the book can be used as a background guide and "yardstick" in this survey of the industrial exhibits.

Supply and Distribution

In the broadest sense, of course, everything electrical contributes to higher production, even the national position in regard to generating plant, as the power cuts and load shedding of the past several years have shown, but gone is the spate of models of power station exhibits at the Fair and the large spectacular exhibits of power station plant and major transmission equipment have almost petered out. True there are a few massive exhibits this year, for instance, the large Lopulco fuel pulverizing mill on the stand of International Combustion, Ltd., and the large tap changer shown by the Metropolitan-Vickers Electrical Co., Ltd. This single-phase type H on-load tap changer has been built for use at the 132 kV terminals of a 120 MVA 275/132 kV three-phase auto transformer, with a voltage range of plus or minus 30 per cent in 18 steps.

It has successfully withstood impulse and power frequency tests, both by itself and when mounted on a full scale prototype winding.

The tap changer is shown associated with a model of the 120 MVA three-phase 275/132 kV auto transformer with on-load tap changing gear at the 132 kV terminals.

That production is equally related to the adequate control of large blocks of power is evidenced by a telemetering working model exhibit by Standard Telephones & Cables, Ltd. Where several generating stations are controlled centrally load readings relating to various points on the system are required at the control centre. This is generally met by telemetering in various forms, but a notable advance in this field of engineering is the impulse frequency system which has been introduced by the company. The system is entirely electronic and provides a simple system capable of transmitting watts, vars, volts, amperes, etc., over individual line circuits with facilities to permit a line circuit to be shared by a number of readings. The system transmits impulses, the repetition frequency of which determines the readings. Line characteristics have no effect on accuracy and the system will operate over any line capable of transmitting impulses. Similarly any form of impulsing circuit may be used, e.g., d.c. wire lines, voice frequency, carrier, etc.

The telemeter consists essentially of an arrangement in which two opposing currents are balanced with (*a*) the average current due to a fixed capacitor charge for each incoming impulse, and (*b*) a steady current obtained from the circuit of the indicating meter. The error is less than plus or minus 1 per cent of the full scale reading in addition to the very small error of the transmitting device, which is normally a kWh meter. An electronic telemeter transmitter and receiver is also included, utilizing teleprinter coding.

Stress is laid on the economy of using aluminium for cable sheathing and for overhead line conductors by British Insulated Callender's Cables, Ltd. A saving of up to 20 per cent is claimed in the case of cables and up to 50 per cent in the case of overhead lines.

Continuity of service is most important in the production field. The "No-break" engine alternator set being displayed by the Electric Construction Co., Ltd., developed very largely as an export line, is an example of the preservation of continuity.

(1) Lopulco pulverizing mill. (2) Standard Telephones impulse frequency telemetering system. (3) E.C.C. essential service engine-alternator set. (4) English Electric industrial switchboard. (5) Dennis intake distribution board. (6) Ferranti m.d. alarm. (7) Baldwin underground distribution box. (8) B.I.C.C. aluminium cable sheaths and overhead conductors

The essential features are a synchronous induction motor-alternator, a flywheel, an electromagnetic clutch and a diesel engine. Normally the set runs as an induction motor from the public supply, driving the flywheel. If the supply fails, the electrical end becomes an alternator and the flywheel starts the engine through the magnetic clutch. When the supply is restored the alternator is automatically resynchronized with the public supply and the engine stops.

Higgs Motors, Ltd., showed us a new a.c. generator which is self-regulating by virtue of an incorporated starting and battery charging winding. The British Thomson-Houston Co., Ltd., is showing a close voltage regulation engine driven alternator. The regulation is plus or minus 5 per cent of normal rated voltage at power factors between unity and 0·8 lagging. It is self-excited and the control is effected by magnetic saturation.

In a more limited sense continuity of supply (in peak load periods) can also be associated with the maximum demand alarm being shown by Ferranti, Ltd., but the question of cost reduction is prominent as well. The alarm averages the load over 5-minute periods and it compares the load with a "target" set on the 30-minute tariff m.d. period. If the average load over 5 minutes is high compared with the target a pair of contacts close, operating an alarm or a load shedding circuit.

With adequacy of supply there must be adequacy of internal distribution, and some first-rate examples of intakes and main distribution boards are being displayed at Birmingham. There is, for example, a heavy duty intake and distribution equipment on the stand of G. P. Dennis, Ltd. It is complete with heavy busbars, exposed for the show, in a central chamber and outgoing units are 400 A, 200 A, 100 A and 60 A switch- (cartridge) fuse units.

Then there is the compact industrial switchboard on the stand of the English Electric Co., Ltd. It incorporates the main circuit breaker and switch-fuses for factory feeders, and it is shown in association with a 200 kVA transformer representing the company's complete substations which are eminently suitable for factory supplies.

An old regular closely associated with the factory substation and making an important contribution to higher production is the Ferranti moving coil induction voltage regulator. This year's model is of 50 kVA.

The object of an underground heavy duty cable disconnecting box seen on the stand of J. H. Baldwin & Co., Ltd., is to provide easy means of isolation without interrupting the supply to all the consumers.

Finally, in connection with factory distribution, we emphasize the importance of the busbar system of "internal" distribution of which the Power Centre Co., Ltd., has a comprehensive display. The company's busbar systems are available in capacities of from 100 A to 2,000 A per phase, having facilities for plug-in or fixed tap off fused units and being suitable for mounting horizontally or vertically on walls and roof trusses.

Motors

It has become convenient to the production engineer broadly to classify his subject under two main headings—processing and materials handling. In the former, as with almost every electrical aspect of production, the motor must take first place, although it seems that where the motor is an independent driving unit for any processing plant it is regarded separately as "the drive," while where the motor is incorporated in the driven machine or plant, the whole of the equipment, including the motor, becomes a processing machine.

Brook Motors, Ltd., displays "steps in an increasing range from 0·166 h.p. to 300 h.p." A point which, we think, may have been missed in connection with the British standardization developments of recent years to permit interchangeability with American equipments, is that the British development allows for a higher output for any given frame size. The importance of this is stressed by Higgs Motors, Ltd., English Electric Co., Ltd., and Newman Industries, Ltd., in connection with their appropriate exhibits, and at the Newman stand the point was made that the complete interchangeability of the frame lends to speedy rectification of breakdowns. It was remarked everywhere how greatly the individual drive is on the increase, and how this also isolates electrical breakdowns and reduces production stoppages.

Because of the urgent call for increased mechanization of the coal mines the flameproof motor is again taking a prominent

place, and to name only a few excellent exhibits in this class there are those of Newman Industries, English Electric and Metropolitan-Vickers. The Metrovick motor, however, has been designed particularly for the oil refining industry and it has the barrel concentric double shell feature which has been so successful in coal mining.

The English Electric Co. shows an example of its crane motor and it reports that considerable orders are being received for it for use on the larger type of handling

(1) Display of Brook motors. (2) Metrovick double-barrel flameproof motor. (3) B.T.H. electronic motor control display. (4) Newman flameproof motors. (5) English Electric flameproof (left foreground) and crane motors. (6) Higgs geared motor units

(1) G.W.B. electrode water heater. (2) Alfred Herbert Sigma inspection machine. (3) Scottish Machine Tool Corpn. press. (4) Incandescent Group electrode furnace (model). (5) Windsor injection moulder. (6) Holden & Hunt welding-principle heaters. (7) Geo. Bray "Tubalox" industrial elements

cranes. The special features are high starting torque and ability to operate under arduous conditions without the maintenance normally given to motors in more accessible positions.

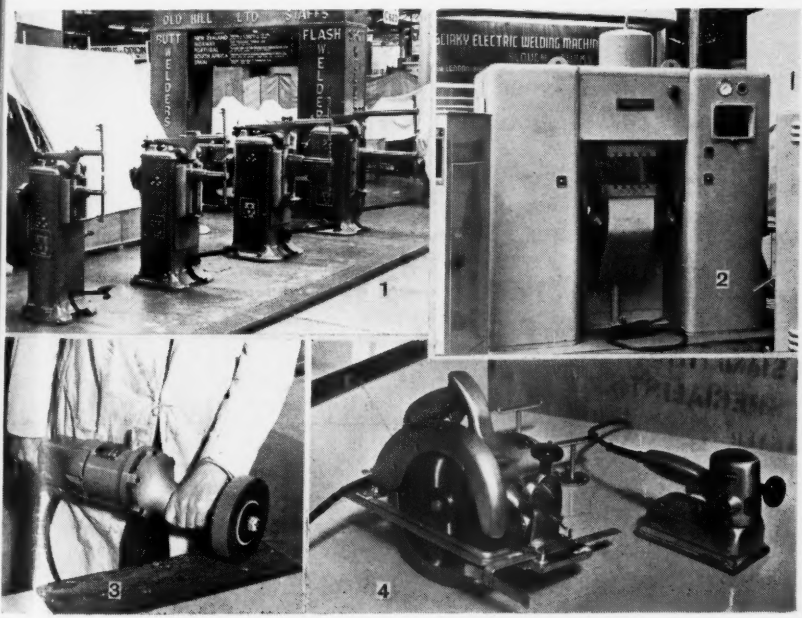
Higgs Motors, Ltd., also think that the geared motor unit represents one of the biggest aids to greater production, largely because of the increasing popularity of the individual drive. The company has a range of such units extending from ⅛ h.p. to 35 h.p.

As regards motor control gear we direct attention to a B.T.H. exhibit which represents direct electronic control for variable speed drives. It consists of a 5 h.p. electronic motor control cubicle specially developed for the hosiery industry, which provides six pre-set speeds by means of a series of rheostats. There is also a control station which enables these speeds to be selected either by means of push-buttons or by a special switch driven by a small geared motor unit. If infinitely variable speed is required a change-over switch can be set to make possible the use of the speed control rheostat. The cubicle can be used for many other applications requiring about 5 h.p. and a speed range of about 15 to 1.

Processing

To deal more directly with processing machines, i.e., those with incorporated drives, there are numerous examples, particularly in the Engineering Section and in the Outside Exhibits, of which we can refer only to a few. First there is the automatic injection moulding machine on the stand of R. H. Windsor, Ltd. This will produce thermo-plastic components of 1 oz normal capacity. The injection is done hydraulically by means of a motor driven oil pump, while a small motor inside drives the control gear. The material cylinder and the nozzle are electrically heated by bent heaters clamped outside the cylinder.

Secondly, mention should be made of the imposing exhibit of the Scottish Machine



(1) Holden & Hunt resistance welders. (2) Sciaky heavy duty welding equipment. (3) Wolf high speed grinder. (4) Black & Decker "Ripsnorter" saw and sander

Tool Corporation, Ltd., a heavy duty 200 ton press.

In this section also is the Sigma multi-dimension inspection machine displayed by Alfred Herbert, Ltd. The machine has appropriate combinations of electric gauges to suit the inspection requirements of the component, and it can be equipped for magazine or conveyor feeding. With hopper feeding one operator can attend to four machines, maintaining an hourly output of 4,000 components per machine. The parts are transferred to the gauging position by a workholder on a reciprocating slide, and when the gauges make contact with the component the results of inspection are indicated by signal lamps—red for minus errors, yellow for plus errors and green for accepted components.

Heating

In earlier years there were always some electrode and induction melting furnaces to be seen at the Fair. But this year we have not seen one actual electric melting furnace of any kind. The electric furnace business is going ahead at an increasing rate and it is a pity that this development is not reflected at the Fair.

The nearest approach we saw to the electric melting furnace was a model of a Metalectric three-phase swinging roof arc furnace for steel making on the stand of the Incandescent Group. With a capacity of four tons and an electrical rating of 1,500 kVA it is equipped for hydraulic tilting which is becoming a very popular method. The company makes furnaces of this type of up to 50 tons capacity.

While the 800 kW " Autolec " electrode storage water heater shown by G.W.B. Electric Furnaces, Ltd., will supply hot water for processing as well as for space heating, the company stresses that from the production aspect its real value rests in reduced overheads and the release of labour for direct production.

This particular model has an output of 2·72 million B.Th.U./hr and the operating voltage is 400. A master rating control permits pre-selection of the maximum rating, and a two-position thermostat provides for 5 deg above and below the required temperature. Holden & Hunt heaters on the resistance welding principle, with the work inserted between the electrodes as in spot welding, suggest an excellent scheme for flow-line production.

The display of " Tubalox " industrial heating elements by Geo. Bray & Co., Ltd., tells a remarkable story of the adaptability of modern embedded elements. Ring, strip, pad and cartridge elements show how the product can be shaped into almost any form.

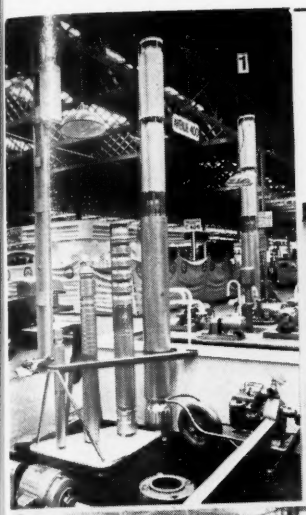
What we have said earlier about the absence of electric melting furnaces seems to apply equally to heat-treatment furnaces and particularly, after such good representation at the Fair in more recent years, to the h.f. inductor heater. The English Electric Co., Ltd., is, however, giving expert bureau service on this subject and it stresses the value of radio frequency heating in connection with hardening, billet heating and soldering, particularly the last mentioned in awkward jobs like the soldering of spouts on kettles.

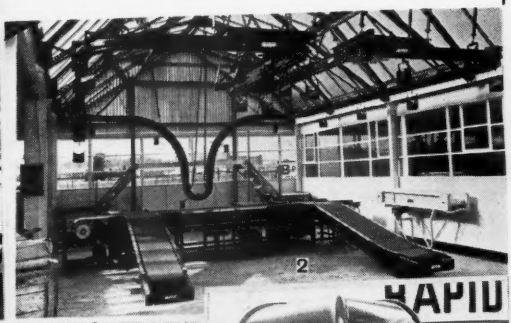
Welding

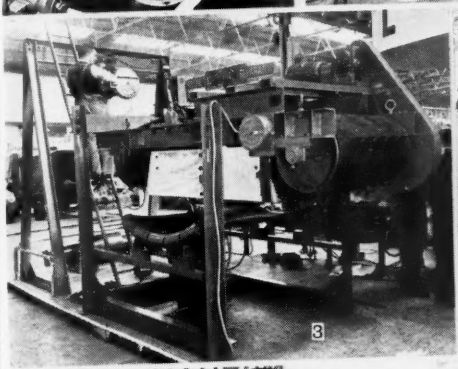
Two notable examples of welding plant are the excellent resistance spot welders on show by Holden & Hunt, Ltd., and the heavy duty equipment which we saw on the stand of Sciaky Welding Machines, Ltd.

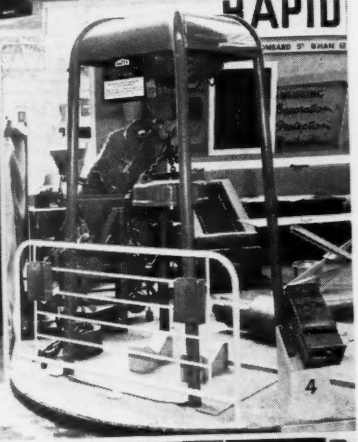
The potentialities of portable electric tools in increasing production are very great. The new 6in portable heavy duty grinder introduced by Wolf Electric Tools, Ltd., is claimed to remove about double the stock per minute as compared with similar existing machines. The main reason for this is the much higher speed, viz., 5,600 r.p.m. To cope with this high speed a resinoid bonded grinding wheel must be used and this is readily available. The main application of the tool is weld dressing, but it is also suitable for fettling and general foundry grinding.

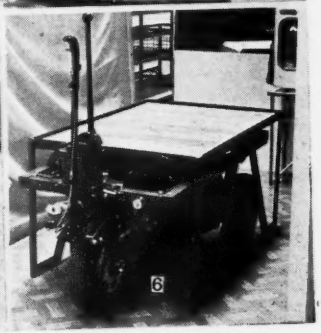
Any electric tool, said a representative of Black & Decker, Ltd., contributes to higher production as there is less fatigue to the operator, permitting much greater manual effort than is possible without the electric tool. But progress has resulted in even greater effect from this viewpoint, as is shown by three new tools. On the Black & Decker stand is the 8in " Ripsnorter " saw, a powerful single-handed saw having a $2\frac{1}{8}$in depth of cut; it can be used for bevel cutting at up to 45 deg and it can also be regulated for depth of cut. Seven different types of blade are available to











(1) Beresford submersible pumps. (2) Fisher & Ludlow overhead conveyor exhibit. (3) Electromagnets overband salvaging separator. (4) Rapid Magnetic lifting magnet. (5 The new " Stacatruc." (6) Diamond high stillage truck

permit the cutting of different materials, such as timber, asbestos, brick, tile and non-ferrous metals. The power-weight ratio is extremely favourable.

Another new Black & Decker tool is an orbital sander weighing only 5 lb. The orbital motion of the pad ensures a satin smooth finish of the wood and the surface cannot be gouged or burned on account of the low friction afforded by the motion. The abrasive paper used is open coated aluminium oxide with three different grits.

A third new tool is the 6in standard bench grinder which can be supplied with a single-phase or a three-phase motor; it is a useful tool to have around the engineering shop for general grinding, sharpening, wire brushing, etc.

Materials Handling

According to the E.D.A. publication to which we have referred, in the metal industries, to take only one example, for every ton of finished product the equivalent of 50 tons of material is handled. Couple this rather startling statement with an appreciation of the relatively low h.p. required for conveyor drives and of the inherent adaptability of electric control, particularly automatic sequence control, and the significance of electrical methods is apparent.

This is brought out particularly well in one of the exhibits of Fisher & Ludlow, Ltd. Generally, normal production units are fixed in their layouts on flow principles, but in nearly every case there comes a time when it is required to take the product away from the production line for a further operation in another part of the factory. The simplest way of doing this without interfering with the general production layout is to introduce an overhead chain conveyor which can carry the product direct from one point to the other by means of the head room in the shop which is so rarely used.

This point is well illustrated by the "Flowlink" conveyor exhibited by the company which incorporates a vertical section with a small radius bend, and also demonstrates how a complete conveyor can be built from standard parts. Our illustration also shows small radius horizontal turns by means of sprockets, and standard pressed steel bends of slightly bigger radius.

A distinctive feature is the design of the track in which the chain runs in such a way that no stresses are imparted to the building other than the deadweight of the conveyor on load. The single driving unit, which employs a standard 1½ h.p. motor, is suitable for a chain pull of 1,000 lb. For installations with greater chain pulls than this additional driving units are used and the drives are synchronized by fluid flywheel couplings.

The lifting electro-magnet considerably speeds up the handling of all types of iron and steel, such as bars, scrap, billets and ingots in steelworks, and also reduces the ground labour required. Electromagnets, Ltd., is showing in operation such a magnet of 26in diameter which is capable of lifting up to three tons on solid load. We were also impressed by the compact heavy duty lifting magnet for loading, unloading and transporting steel, pigs, scrap iron, etc., on the stand of Rapid Magnetic Machines, Ltd.

Of outstanding interest in the displays of magnetic separating equipment is the large overband separator displayed by Electromagnets, Ltd. It has been specially designed for the reclamation of tins and general ferrous metals from household refuse.

The battery truck is one of the biggest contributors to higher production in the materials handling field. In this connection we may mention the new model 45EH/9 "Stacatruc" displayed by I.T.D., Ltd. Its lifting height is 9ft and its maximum loads at 20in and 24in centres are 4,500 lb and 4,000 lb, respectively.

The high stillage truck displayed by Diamond Motors (Wolverhampton), Ltd., is particularly suitable for transporting such materials as bricks and, with a special rack stillage, long loads such as bars and tubes.

It is surprising how little the pump is regarded as a materials handling equipment; yet it is one of the most efficient equipments in this field for all types of production, particularly the electric submersible pump with its electrical stator and rotor integral with the corresponding parts of the pump. This type of pump is well represented on the stand of James Bere ford & Son, Ltd., in various sizes and for many uses.

Domestic Appliances

THOUGH numerically showing little sign of revival of their former comprehensiveness, this year's displays of domestic electrical appliances do nevertheless include rather more new items than has been the case for the past year or two. Labour-saving appliances are particularly to the fore and should have a special appeal in view of the recent reduction in purchase tax. Gone are the days, however, when a visitor to the Fair could inspect a dozen different makes of electric cooker: to-day he can discover only a single representative, a unit included in a selection of English Electric domestic appliances, which comprises also a refrigerator, two washing machines (with ironer attachment, if required), a food mixer and a plate warmer.

Apart from the improvement in safety features in general and guards in particular, there are signs in heating appliance design of the attention which is being paid to the further increase in efficiency. In Berry's "Raydair" low-temperature radiator, for example, the rearward radiation has been eliminated and all the heat from both front and back surfaces of the heating element is carried forward into the room. In the same company's "Magicoal" series, too, a highly efficient and safe reflector fire, the "Homeberry," is introduced at what is a remarkably low price for this class of apparatus.

All the Ferranti fires are now appropriately guarded and a panel model of the now well-known "Safera" reflector fire makes its first appearance. By means of a special display, the makers are also emphasizing the importance, from the point of view of reducing failures and maintenance, of using only Ferranti elements for Ferranti fires. An oil-filled radiator intended particularly for installing under low windows has been brought out under the name "Coronation" by Dimplex, Ltd., whose flameproof radiators have now been Buxton approved for installation in gaseous atmospheres Groups II and III.

Among washing machines there appears to be an increasing tendency to provide facilities for heating the water, if desired. Wilkins & Mitchell, Ltd., who show a range of their "Servis" models, were one of the first companies to have elements incorporated. An example of the application of this idea to one of the somewhat smaller types of machines is to be seen on the Clegg & Coupe stand. Anyone possessing a vacuum cleaner and a wash boiler can obtain washing machine facilities by the use of the "Posser-matic" attachment which L. G. Hawkins & Co., Ltd., have recently brought out. For use in their "Launderette" establishments Bendix Home Appliances, Ltd., have developed an extractor to carry the drying a stage further after the clothes leave the spin dryer of the washing machine. To meet the demand for a machine for use in restricted space, the British Vacuum Cleaner and Engineering Co., Ltd., has brought out a new model taking 4 lb of dry wash but occupying a floor area only 17⅝in sq. A power wringer is now available from Acme Wringers, Ltd.

Two very definite tendencies are noticeable in connection with irons: a reduction in weight and the use of elements built into the soleplate. Both features are to be seen in the Premier "Sylph" model, which weighs only 3¼ lb and has the elements set in magnesium oxide inside the soleplate. The makers, who claim to be the first in this country to have used this type of element for irons, say that the elements are practically indestructible.

However, there still remains a strong demand for the heavier type of iron and a new pattern of the Premier "Smoothwell" model without thermostatic control, which has now proved its reliability for about thirty years, makes its appearance in modern guise: it weighs 4¾ lb and has a loading of 450 W. The cordless type of iron made by J. & H. Walter, Ltd., has its own special appeal and, to obviate any risk of scorching, the Bylock "Victor" model is balanced so that the soleplate comes into contact with the working surface only when the actual ironing operation is in progress. The "Steam-o-matic" steam iron weighing under 3 lb and loaded at 1,000 W is now available from Kenwood Electrics, Ltd.

Having hitherto concentrated their attention in the domestic appliance field solely on washing machines, Wilkins & Mitchell,

Ltd., enter a new market with two new "Servis" refrigerators with capacities of 3 cu ft and 7·6 cu ft. Both incorporate hermetically sealed refrigeration units. The smaller model is of the table top type, while the 7·6 cu ft unit has such special features as a large compartment for frozen foods, four ice trays making 5½ lb of cubes per freezing, twin "saladors," an extra deep "Chillator," eye-level thermostatic control and 13·4 sq ft of shelf area. Various modifications have been made to the Astral 1½ cu ft absorption type refrigerator. Instead of a three-position switch at the top, a thermostatic switch has been provided at the bottom. A white plinth has been substituted for the two black feet, and two ice trays now make it possible to produce twenty cubes at a freezing.

Several recently introduced vacuum cleaners are to be seen this year. Bylock Electric, Ltd., shows a new floor polisher for the first time. No fewer than twenty different types of industrial floor cleaning and maintenance machines are demonstrated by Columbus-Dixon, Ltd. Among these are a new floor dryer and squeegee and a new power floor scraper. The last is designed to remove in a dry state, without the use of detergents or steam, built-up deposits of impacted grease, dirt or other material from floors or factories, garages, etc. It is easily operated by one man.

Thanks to the removal of restrictions on the use of copper, Bulpitt & Sons, Ltd., are now once more in a position to supply a wide range of "Swan Brand" kettles in capacities from 2 to 6 pints, with standard or rapid loadings and alternative finishes. As the use of nickel is still restricted, a substitute has had to be employed as an undercoat for chromium, but the result appears quite satisfactory in both Bulpitt and Premier kettles, etc. Bulpitts have also employed speculum finish with attractive results.

Another material, in this case selected from choice rather than necessity, has been employed as an alternative to metal by Falk, Stadelmann & Co., Ltd., for their "Auto-Perc" coffee percolator. This is white porcelain tastefully decorated with a traditional design of moss roses in pastel colours. A dual-purpose switch gives "automatic" and "personal taste."

Appearance, too, is the striking feature of the latest "Thermat" electric blankets now being made with attractive patterns. These blankets, which are to be seen on the stand of H. J. Baldwin & Co., Ltd., are not thermostatically controlled and thus do not interfere with radio and television reception.

The demand for a low-priced food mixing machine is met by the new "Kenwood Minor," costing about £10, which is to be sold in this country for hanging, when not in use, on a wall bracket holding also the two beaters. For export it will be supplied complete with stand, bowl, etc. Additional accessories now available for the standard Kenwood mixer include a juice separator and a tin opener. A larger model is also being made with a capacity of 6 quarts instead of 6 pints. An improved model of the Hoover "Glassmaster" washes 1,500 mixed glasses of all types an hour.

A considerable amount of new lighting equipment makes its appearance, both domestic and industrial. Complete suites of fittings, comprising pendants, wall brackets, table lamps and floor standards, are available from Wm. McGeoch & Co., Ltd., who include in their display a number of new carved wood fittings in gilt, off-white and ivory. A range of attractive three-light pendants, some selling for under £3 and none for more than 4 guineas, is attracting considerable attention on the stand of the Osborn Manufacturing Co., Ltd. French lace pattern glass pendant and ceiling types are among the latest Berry lighting fittings, which also include new Dutch brass designs and cylindrical glass lanterns, a greatly enlarged model of which has just been selected for installation at Longton Town Hall.

A new post-top street lantern housing five 8ft U-shaped cold cathode tubes indicates one of the most recent developments in lighting to be seen on the General Electric

See opposite page: **(1) Wm. McGeoch lighting fittings, including examples of the new carved wood ty e. (2) A selection of Berry's modern glass lighting fittings, with a "Haddon Hall" "Magicoal" fi e. (3) Bendix "Launderette" extractor with commercial type washing machines in the backgrou d. (4) Selection of English Electric domestic appliances, including refrigerator, two washing machin s, cooker, mixer and plate warmer. (5) G.E.C. street lighting display with new post-top lantern hous g five 8ft U-shaped cold cathode tubes in the foreground. (6) Dixon power floor scraper. (7) Impro d Astral 1½ cu ft refrigerator**

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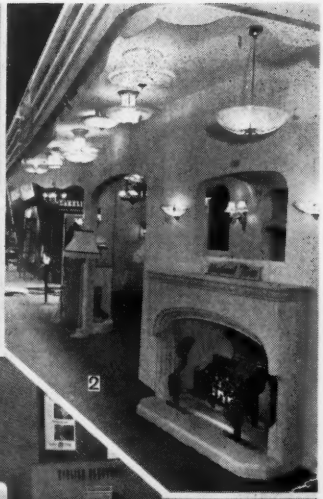
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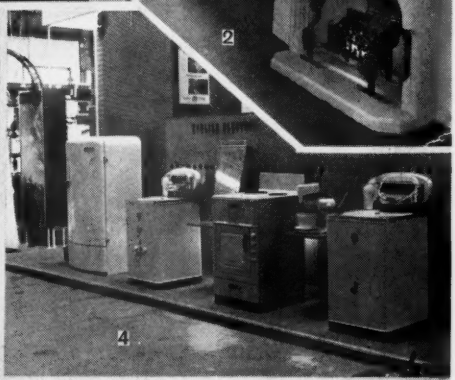
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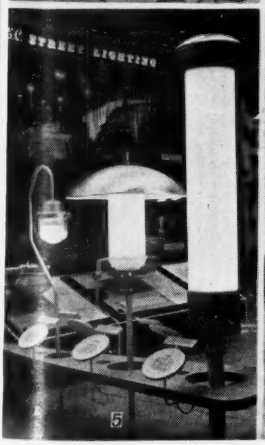
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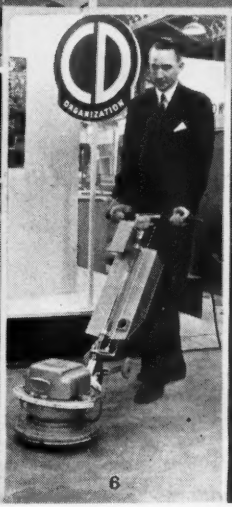
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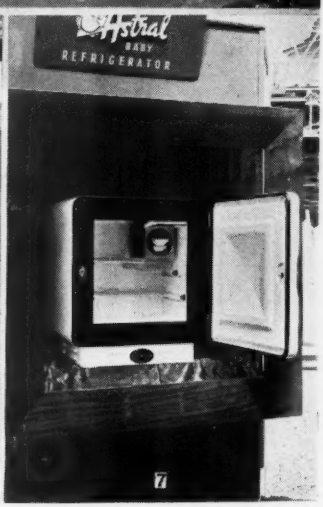
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Co.'s stand, which is devoted entirely to lighting history, research and application. Airport lighting is demonstrated by a special exhibit which shows the onlooker how an airfield appears to the pilot of a plane by day and night. Among a number of new B.T.H. lighting fittings is the "Mazda Monolux" 5ft single-lamp fluorescent fitting, features of which are two-screw fixing and a lampholder which permits one-hand lamping from either end. Other new B.T.H. units include a high-bay tungsten lamp reflector, a four-lamp cold cathode fitting with a safety interlocking device for cleaning and re-lamping, and three street lighting lanterns—a fluorescent unit, the "Sapphire," for use with mercury vapour lamps, and an all-"Perspex" sodium open lantern. The "Mazda" 75 W reflector spotlight is probably the first standard light source of its kind to fit an ordinary domestic lampholder.

(1) Osborn Mfg. Co.'s display of "Cobra" lighting fittings. (2) B.T.H. "Monolux" fluorescent lighting fitting with two-screw fixing. (3) Berry "Homeberry Magicoal" fire. (4) Ferranti "Safera" inset fire. (5) "Thermat de luxe" patterned electric blanket. (6) Wilkins & Mitchell "Servis" 3 cu ft and 7·6 cu ft refrigerators. (7) Falk, Stadelmann porcelain "Auto-Perc" coffee percolator with its metal counterpart

Wiring and Components

THE steady improvement in respect of both the design and quality of house-wiring components during the last few years is now becoming evident although more may still be hoped for with regard to ease of installation, especially now that economies in wiring practice are being discussed. Furthermore, not all such components at present available have the ability to withstand their rated full load without tending to overheat. The display of this kind of product at Castle Bromwich is perhaps even more disappointing in number and variety than it has been for the last two or three years, which is a pity since the original export intention of the Fair presumably remains as a primary object.

Interesting items on one of the two stands of Falk, Stadelmann are the rectangular "Realflush" and the circular "Nearflush," companion switches to the well-known "Surflush," both being of competitive design and constructed to save labour costs in installation. The "Nearflush" is a shallow type switch $\frac{7}{8}$in deep, excluding dolly, which dispenses with a block or pattress. The base is designed to house the sheathing of t.r.s. or p.v.c. cable when mounted directly on the wall, in which way the switch is made to conform with Clause 404J of the twelfth edition of the I.E.E. Regulations. It has four knock-outs for back entry for sunk wiring and two for top or bottom entry surface wiring, being available for one- and two-way, one- and two-gang, brown and white, a.c. only.

The "Realflush" houses a standard plate of B.S. 1299 dimensions but a clever way of fixing the grid permits two screws only to show on the outside of the plate which is perfectly plain. The switch unit is mounted on the grid which rests on the wall or tile over the sunk box; hence packing or alignment of the switch within the box is not necessary. Fixing slots allow for variation for badly placed boxes in both one- and two-gang examples, this method being unusual for two-gang switches. A special multi-gang model is also made with heavy "Perspex" plates for institutional installations. White and cream name-plates are stocked but other colours are available on request. The "switch on grid" system of fixing means easy mounting of multi-gang units and represents a considerable saving of installation time.

A fresh item in the Metway display is a rubber gasket for lamps in striplight holders. The short rubber sheath is pulled on so that the standard b.c. bulb is just gripped to prevent the entry of water when the lamps are upright instead of being hung in the more usual downward position.

The fused Clang rotary dimmer, zero to full, is used for lamps, fans, etc., on any circuit passing not more than 120 W through one dimmer. It saves energy because it does not insert resistance in the circuit. The demonstration model is mounted alongside a wattmeter while the lamp circuit is taken through a centre button plug (above) of the three-pin ejector 5 A type which does not require force to withdraw it from the socket; one simply grips the flange between two fingers and presses the centre button with the thumb. A three-pin 15 A similar plug will shortly be in production.

The so-called "multi-plugs" (a form of adaptor) are robustly made and are now all-white instead of brown as formerly; there are 5 A and 15 A three- and two-pin models but the 13A is three-pin only. There are also one-way and two-way ceiling switches in a range of three colours.

The complete range of Donovan distribution gear for from 240 to 440 V is conveniently shown on a single panel illustrating fusegear of both the rewirable and h.r.c. cartridge types, "Safuse" switch fuses, isolating links and plugs and sockets.

An excellent way of protecting delicate electrical components is to enclose the whole in Bakelite flexible polyester resin to safeguard them against shock, moisture or climatic attack ("tropicalization"). A rectangular block contains a radio valve, capacitor and resistors. A larger object is a transformer inside a bag which has been impregnated rather than moulded.

Applications of the mineral insulated and copper sheathed cables of the smaller overall diameters now made by Pyrotenax, Ltd., continue to increase. This year a section of a concrete floor and plastered and

papered wall are heated by embedded cable of this type. There is also a section of catenary concentric wiring which is claimed to show a saving of some 45 per cent on cable cost. Catenary suspension avoids bridging roof trusses and supports for power cables as well as gaps between buildings.

The " lighting " class of cable of this kind is about half the diameter of the 660 V type and is available in thirteen sizes for general purpose lighter current circuiting.

Although developed originally for use in a normal insulated return system, the copper outer sheath renders it very suitable for

(1) Range of Donovan distribution gear. (2) Example of Pyrotenax catenary concentric wiring. (3) Demonstration models of Falk's new switches. (4) The Clang 120 W rotary dimmer with watt-meter on left and ejector plug above. (5) Bakelite "potted" circuits in polyester resin. (6) Metway rubber gasket for striplight lamps

earthed concentric wiring and it has been successfully employed in a number of large installations. When properly arranged so as not to contravene regulations the copper sheath is utilized as the return conductor and good bonding is ensured with junction boxes and terminal appliances by the makers' glands. Single-core cables of this kind used in this manner should cost less than twin cables of equivalent conductor size used in an insulated return system. Earthed concentric wiring also eliminates neutral links and so reduces the cost of distribution boards, while in the case of the smaller sizes of cable the conductance of the sheath is up to eight times that of the conductor and voltage drop is therefore less than half that of an insulated return system; thus smaller sizes of conductor may often suffice.

Although the single-core cable, as used in an earthed concentric system, carries current both in the insulated conductor and in the sheath the current rating (based on 40 deg C temperature rise) is hardly reduced because of the high conductance of the sheath return path and the very small increase of watts dissipation, but there are precautions to be observed in installation with respect to compliance with regulations.

The small corner stand of the Cable Makers' Association is a joint representation of member firms, but it is little more than a token and there is insufficient representation of cables and wires as a whole considering the variety now available and the changes which will result from the expected revision of B.S. 7 for rubber insulated cables and flexible cords for power and lighting purposes with which there will be issued a completely new B.S. for p.v.c. insulated cables for generally similar purposes.

The requirements that will be called for in these new documents will differ markedly in several important respects from the 1946 requirements, particularly with regard to the thicknesses of insulation for the 250 V cables and the sheath thickness. Further physical tests for both are also being included, most of which have not appeared before. Dimensional changes are perhaps the most important feature of the new specifications; in addition to reduction of insulation thickness and the uniform thickness of sheathing that has been adopted for tough rubber, p.v.c., and lead sheaths in the lower diameter ranges, all cables having these types of sheath within the prescribed range will be of common overall dimensions. There will be other changes of interest to buyers and users, particularly the introduction of such other types as the h.s.o.s. cables, t.r.s. cables with semi-embedded braid and " figure-eight " flexible cords.

Since the B.S. 7 revision will affect cables which are specified in British Standards, particularly B.S. 883 for shipwiring cables and v.i.r. armoured cables for collieries, it is proposed to publish these new or revised documents at the same time as B.S. 7 : 1953 some time this summer.

When cables manufactured in conformity with the new specifications are marketed, there is not likely to be any change of the classification references by which the various types are now well known to users; instead supplies will be readily identifiable by the use of distinctive coloured labels.

LONDON SECTIONS

As usual, most of the vacuum cleaners and allied appliances are to be seen at Earls Court, London, but the display here is disappointingly small and there are very few new items on view. As was the case last year, only six firms are represented in this section. The exhibit of the British Vacuum Cleaner & Engineering Co., Ltd., includes special types of " Goblin " cleaners as used in textile mills and by the railways and airlines as well as the usual range of domestic models. This company's display also points out that the vacuum cleaner is a British invention, the first model having been patented by Mr. H. Cecil Booth in 1901.

Apart from its full range of cleaners and polishers, Hoover, Ltd., is showing its new washing machine. This has a larger capacity than the model previously made, it also has a bigger wringer, an automatic pump for emptying and wheels for ease of movement around the kitchen.

Among the exhibits of Bylock Electric, Ltd., is the new " President," three-brush domestic floor polisher which has been produced mainly for export. Other items include hair dryers, hand dryers, domestic cleaners and the " Victor " tip-up thermostatic safety iron. This iron is so designed

that the sole plate automatically raises itself from the work when the hand is removed. Apart from its cylinder type cleaner and a pressure cooker, Filleries (Great Britain), Ltd., has an attractive looking combined vacuum cleaner, polisher and scrubber.

Cleaners, floor polishers, sprayers and the handyman's light sanding, polishing and drilling machine are shown by Electrics, Ltd., and New Welbeck, Ltd., displays a single high power suction cleaner with metal dirt container, as well as duplex and triplex composite machines which can be used either as single or multiple units.

At Olympia the electric clock industry is again well represented and many new models are on view but these, however, have involved changes in exterior appearance rather than new designs of movements. Apart from striking, chiming, alarm and other clocks there are industrial clocks, time switches, recorders and systems of synchronous "slave" dials controlled from a central master clock.

At Olympia too, most of the decorative lighting fittings can be found, but the number of firms displaying them is small.

Board and Contractors

Another South Wales Joint Conference

ON Friday, last week, at the Esplanade Hotel, Porthcawl, the Liaison Committee of the Electrical Contractors' Association and the South Wales Electricity Board held its third joint conference and dinner. Mr. L. Howles, chairman of the Board, presided at the conference, and after his opening remarks a paper was presented by Mr. W. P. Warren, B.Sc., A.M.I.E.E. (S. Wales Board) on "Opportunities for Service to the Industrialist." In this the author set out ways in which contractors and Board engineers could assist factory owners to select and lay out their electrical plant and lighting, draw their attention to the benefits of the application of electricity in processes and materials handling and show them how to improve their power factor, etc.

After an informal luncheon, a paper was read by Mr. J. F. Smith, B.Sc., M.I.E.E., the Board's chief commercial officer, on the standardization of electricity tariffs. In this the history of tariff construction was briefly reviewed and an analysis was included of the number of consumers in each Electricity Area on various types of tariff. Reference was made to a sample survey of consumers in South Wales as a preliminary to designing standard tariffs which would cause the least disturbance and tables showed how consumers were affected. It was claimed, after twelve months' experience, that in relation to the magnitude of the task the disturbance was "quite modest." The author stressed the fact that charges could be reduced only if consumers made better use of the service.

Following this there came a paper by Mr. N. W. F. Green, A.M.I.B.A.E. (introduced by Mr. A. J. Dalton, A.M.I.E.E.) on "The Farmer as Consumer—Customer Load Building in Rural Areas." This was based on the text that the present average revenue from the sale of electricity in rural areas was uneconomically low and the author aimed at showing Board engineers and the contractors how to educate the farmer electrically in their common interest and for the good of the public. The author did not deal with the domestic side, expressing the opinion that the farmer's wife was ahead of her husband electrically. Attention was paid to certain lines of development—lighting, dairy equipment, barn machinery, grain drying and crop preservation plant, pigs and poultry, water supplies and horticulture. Brief details of the equipment available and an idea of operating costs were given. The necessity for building up goodwill and providing after-sales service was underlined.

The proceedings concluded with a dinner in the evening.

VIEWS on the NEWS

By REFLECTOR

THE Trafalgar Square fountains are in the news again and the impression is given that there is plenty of water but too little electricity. They are to play from 10 a.m. to dusk daily and on Wednesdays and Saturdays they will carry on until 11 p.m. and will be illuminated. Thus London, which was once the centre of the Western world, will demonstrate to visitors that it is doing its best to pull the nation round by the exercise of this considerable economy. The Ministry of Works is to be commended for its magnificent example to other Government Departments.

* * *

A short time ago a correspondent mentioned in the *Electrical Review* an early form of electric cooker devised in 1905 by Mr. Napier Prentice of the Suffolk Electricity Supply Co., Ltd. In the Eastern Electricity Board's magazine two men contribute reminiscences of these cookers—Mr. S. Doe, who installed a number of them, and Mr. H. Dodson, who used to "service" them. Mr. Dodson says that a chicken was apt to cause trouble because the legs could easily become entangled with the exposed heating element. Earlier models were of cast iron and later ones of aluminium. At least one of these cookers was in service as late as 1929.

* * *

The April issue of "The Welsh Nation," the organ of *Plaid Cymru* (the Welsh Party), is largely devoted to a tirade against the English who take cheaply-generated Welsh electricity for their own selfish uses. Yet I find that in 1952 the South Wales Division of the B.E.A. sent out 3,162 million kWh while the South Wales Electricity Board purchased 3,139 million kWh from the B.E.A., leaving but a small surplus for the rapacious English. It is stated that the B.E.A. made a loss of £1,332,803 in 1951-52. Actually it made a surplus of £4·25 million; it was the fourteen Boards combined who made the loss mentioned. South Wales, as is correctly stated, made a surplus of £324,126 and, although it is hinted that this was made over to the B.E.A., in point of fact £77,000 was put to taxation reserve and the rest was carried forward.

* * *

People in the Torridin district of Rossshire have protested to their M.P. that they are being neglected by the North of Scotland Hydro-Electric Board. But, according to the Aberdeen *Press and Journal*, the Board has good reason for this "neglect"; "a capital cost of £720 per head for sixty small consumers is not an attractive commercial proposition." However much it may desire to see electricity available everywhere in its area there are economic limits beyond which the Board cannot go without financial disaster.

* * *

Electron, the official organ of the Electrical Trades Union, again complains (in the April issue) of the shortcomings of the nationalized electricity supply industry. Among the points mentioned is the reluctance of some Electricity Boards to engage wholeheartedly in electrical contracting and of the B.E.A. to engage in the manufacture of electrical plant. There is a certain naïveté in this. Does *Electron* really think that the Authority can set up in economic opposition to existing manufacturers of boilers, turbines, generators, transformers, cables and all the rest? In any event it is precluded by the 1947 Act from engaging in manufacturing for export which is an important part of British electrical industry. Surely as the principal buyer of heavy electrical plant the B.E.A. is sufficiently well-placed, so far as prices are concerned, not to be so unwise as to contemplate such a drastic departure from its main function.

PERSONAL and SOCIAL

News of Men and Women of the Industry

THE Minister of Fuel and Power has re-appointed **Mr. C. R. Heathcock,** F.C.I.S., of Stourbridge, and **Mr. J. McDowall,** of Sutton Coldfield, as part-time members of the Midlands Electricity Board.

Mr. W. R. Clark Lewis, M.Inst.T., has retired from the position of traffic manager to Babcock & Wilcox, Ltd., after forty-five years' service. He first joined Babcock & Wilcox, in the Erecting Department, in 1907, and transferred to traffic work in the invoice department in 1911, eventually taking charge of the Traffic Department on its inception in 1933. Mr. Lewis was a member of the traffic committees of B.E.A.M.A., and the British Engineers Association, being vice-chairman of the latter committee. He was also a Council member of the Traders' Traffic Conference and a member of the Government Panel of Assessors (Road Haulage Charges) and of the Romford Chamber of Commerce. He is succeeded as traffic manager (London) by **Mr. K. J. McBryde,** who joined Babcock & Wilcox in 1950. He was previously on the staff of the commercial superintendent, British Railways (Western Region), where he obtained some twenty years' experience in railway traffic problems.

Mr. H. O. Hinton, O.B.E., T.D., and **Mr. E. Cooper** have been appointed to the board of A. C. Morrison (Engineers), Ltd. Mr. Hinton, who was formerly with the Brush Electrical Engineering Co. as personal assistant to the late managing director, Mr. A. P. Good, is also a member of the board of Associated British Engineering, Ltd.

Before becoming general manager of A. C. Morrison (Engineers), Ltd., Mr. Cooper was general manager of the Brush Electrical Engineering Co.'s Small Motor Works, Leeds. He was a founder and general manager of Clifton Aircraft, Ltd., and spent nine years as superintendent of the English Electric Co.'s Domestic Appliance Works, Preston.

Mr. Cooper was also with Ferranti, Ltd., and Measurement, Ltd.

Mr. G. Honnoraty has been appointed the senior lamp and lighting salesman at the district office at Birmingham of the British Thomson-Houston Co., Ltd., following the death of Mr. H. Sayce. Mr. Honnoraty first joined the B.T.H. Co. at the Sheffield office, and worked in the Hull and Grimsby area of the east coast before joining the Nottingham depot where he was manager before his appointment at Birmingham.

Mr. G. Honnoraty

Mr. H. Hewitt, lighting specialist with the North Western Electricity Board, has been elected a Fellow of the Illuminating Engineering Society. Mr. Hewitt has made a special study of lighting in the textile industry.

Sir Harry Railing (chairman and joint managing director, General Electric Co., Ltd.) has been re-elected president of the British Electrical and Allied Manufacturers' Association for a further year. **Mr. D. D. Walker,** M.A., M.I.E.E., who has been elected chairman of the Council in succession to **Mr. T. F. Lister,** is joint managing director of Evershe l

Sir Harry Railing

Mr. D. D. Walker

Mr. E. H. Ball

Mr. E. G. Plucknett

& Vignoles, Ltd. He was born in 1905 and educated at Rugby and Pembroke College, Cambridge, where he graduated in 1928 with honours in the mechanical sciences. He joined Evershed & Vignoles in 1930 and was in charge of export sales from 1934-40. He was elected to the board in 1938, became secretary of the company in 1940, and was appointed joint managing director in 1941. Mr. Walker has been a member of the Council of the British Engineers' Association since 1939 and was elected president of the Association in 1951. He is also a member of the U.K. Managing Committee of the Athlone Fellowship.

Mr. E. H. Ball, M.I.E.E., who has been elected vice-chairman of the B.E.A.M.A. Council, is managing director of the British Thomson-Houston Co., Ltd. Mr. Ball spent his early years in South Africa, returning in 1910 to complete his schooling at Victoria College, Jersey. He then gained an honours diploma in electrical engineering at Faraday House. After service in the Royal Engineers from 1914 to 1918, he joined the Export Department of the B.T.H. Co., becoming head of the industrial section in 1927. Five years later he was appointed manager of the Transformer (Sales) Department. In 1944 Mr. Ball was appointed to the board and became managing director in 1948. He was a delegate to the World Power Conference held in Washington during 1936.

At a meeting held on 17th April **Mr. E. G. Plucknett,** director and joint general manager, Simplex Electric Co., Ltd., was elected chairman of the B.E.A.M.A. Domestic Electric Cooker Section. He succeeds **Mr. J. A. Fraser,** who has relinquished the chairmanship following the ending of his association with the English Electric Co., Ltd. Tributes were paid at the meeting to the valuable service rendered by Mr. Fraser both to the Section and to the industry as a whole. Mr. Fraser has served on various joint committees with the B.E.A. and E.D.A. and acted as B.E.A.M.A. representative on B.S.I. sub-committees.

The Council of the Institute of Metals has elected **Sir Arthur Smout,** J.P. (past-president), as a Fellow in recognition of his long and distinguished services to the Institute. Sir Arthur is chairman of Murex, Ltd., and Murex Welding Processes, Ltd., and a director of Pyrotenax, Ltd. Earlier this year he retired from the board of Imperial Chemical Industries, Ltd.

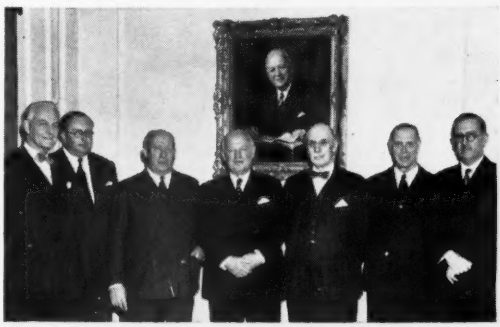
Mr. E. J. Davies, sales director of the Wandsworth Electrical Manufacturing Co., Ltd., was due to sail yesterday (Thursday) in the *Queen Elizabeth* for an extensive tour of the United States. His headquarters will be the Pearson Hotel, Chicago.

The English Electric Co., Ltd., announces the appointment of **Mr. J. C. Andrews** to the Domestic Appliance Division to be responsible for sales training. A centre will be established at Liverpool where Mr. Andrews will organize training in product presentation and salesmanship, for the domestic appliance sales force. These facilities will be offered on a regional basis to the sales staff of the company's authorized dealers and of electricity supply centres. Before joining the English Electric Co. Mr. Andrews was advertising superintendent with J. Lyons & Co., Ltd., in charge of advertising, displays and exhibitions for the Ice Cream Sales Department, and in this capacity was also actively engaged in sale promotion work generally. As a territorial he was called up in 1939, and from 1942 to 1945 served as a gunnery instructor with the 66th Ack-Ack Brigade in England, North Africa and Italy. On demobilization Mr. Andrews joined the staff of the British Legion Headquarters as press and publicity officer.

Mr. J. C. Andrews

Following the recent resignation from his position as a joint managing director of Crompton Parkinson, Ltd., **Mr. Albert Parkinson,** M.B.E., chairman of the company, was presented by the directors with his portrait in oils, painted by Frank Eastman, as a token of their appreciation of his services for the past twenty-six years. Mr. Parkinson became a joint managing director as long ago as 1927 when the present company was formed by the amalgamation of F. & A. Parkinson,

Mr. Albert Parkinson with other members of the board of Crompton Parkinson at the presentation to him of his portrait



Ltd., with Crompton & Co., Ltd. He has been chairman for the past seven years. The presentation was made on 24th April by Mr. E. C. Holroyde, vice-chairman, on behalf of the board, the other members of which were present on the occasion.

Mr. W. B. G. Collis, B.Sc., A.M.I.E.E., has been appointed assistant sales manager, traction department, in charge of traction sales in London of the Metropolitan-Vickers Electrical Co., Ltd., as from 1st March. Mr. Collis was educated at Shrewsbury and at the City and Guilds (Engineering) College. After taking his degree he joined Metropolitan-Vickers as a college apprentice in 1928.

Mr. W. B. G. Collis

In 1931 he joined the Traction Control Department, and six years later transferred to traction sales. During the war Mr. Collis served with the Royal Corps of Signals. He attained the rank of lieutenant colonel and was awarded the M.B.E. (Military Division), and the Territorial Decoration. On demobilization he returned to traction sales, being appointed in 1947 assistant (road traction) to the manager, and in 1948 assistant to the manager.

Mr. J. A. Kennedy, A.M.A.I.E.E., has been appointed area sales engineer in charge of the new technical sales office of Brentford Transformers, Ltd., at Bridgewater House (1st Floor), 58 Whitworth Street, Manchester, 1 (telephone : Manchester Central 7101).

Mr. J. A. Kennedy

Sharples Centrifuges, Ltd., held a staff dinner at Moor Court on 10th April. The event was in honour of its chairman, **Mr. A. H. Keable,** M.I.Mech.E., M.I.Chem.E., to mark his retirement from the position of managing director, which he has held for twenty-five years. Mr. G. J. Keady, president of the Sharples Corporation of Philadelphia, was in the chair, supported by Mr. G. P. Balfour, managing director. On behalf of the parent company, Mr. Keady presented Mr. Keable with a silver coffee set, the tray being suitably engraved. The staff of Sharples Centrifuges, Ltd., gave Mr. Keable an inscribed silver cigarette box, Mr. G. A. Frampton, technical director, making the presentation.

Sir Thomas G. Spencer (chairman and managing director, Standard Telephones & Cables, Ltd.) making a presentation to Mr. F. W. Hicks

Mr. F. W. Hicks, at the age of sixty-four, holds the record in Standard Telephones & Cables, Ltd., of having served the company longer than any other employee, and on 20th April Sir Thomas G. Spencer, chairman and managing director of the company, presented him with his fifty years badge, a letter of appreciation in recognition of his long service, and a television set. Mr. Hicks is at present head of the monthly pay-roll section in the Central Comptroller's Department, Connaught House, London.

This week the *London Gazette* contained a list of awards made in connection with the recent disastrous floods. Further awards are to be included in the Coronation Honours List to be published on 1st June. Among the names in this first list are those of **Mr. Stanley S. Wood,** pumpman at the Croyton oil refinery, who in very difficult circumstances succeeded in starting up an emergency lighting system on a water-intake structure in the Thames when the power supply failed; he is awarded the British Empire Medal. The Queen's Commendation is given to **Mr. F. Sage,** telephone operator, for working an emergency telephone system at Coryton. **Mr. J. J. Bullinaire,** a turbine driver, **Mr. E. G. Butler,** also a turbine driver and **Mr. F. Gregory,** acting charge engineer, receive the Queen's Commendation for their services when the Littlebrook power station was flooded. **Mr. J. W. Holling,** second assistant engineer, Tilbury (Eastern Electricity Board), also receives the Queen's Commendation for ensuring the safety of h.v. apparatus at Tilbury. **Mr. C. T. Skipper,** substation attendant, King's Lynn (Eastern Electricity

Board), is also commended for ensuring the safety of h.v. apparatus, and **Mr. F. E. Westoby,** assistant engineer, Southend (Eastern Electricity Board), receives the Queen's Commendation for maintaining electricity supplies in the Southend district.

Mr. J. L. Walker has been appointed manager of the Leicester Branch of Cryselco, Ltd., from 1st May.

Dr. W. Idris Jones, director-general of research to the National Coal Board, has been elected president of the Institute of Fuel for the 1953-54 session. He will succeed the retiring president, **Dr. G. E. Foxwell,** in October.

The twenty-first anniversary of the formation of **Switchgear & Equipment, Ltd.,** was celebrated at Banbury on 24th April by a dinner and dance given by the directors. The large number of guests included representatives of Electricity Boards and well-known firms in this country and overseas. After the dinner, the managing director, Mr. A. G. H. Oxley, who was supported by Mr. D. A. J. Oxley, assistant managing director, and Mr. D. D. W. Hope, director and secretary, welcomed the staff and guests. Mr. J. R. Bird (South Wales Electricity Board) proposed the toast of the chairman (Mr. A. G. H. Oxley). On the following morning the guests were received by the managing director at the factory and were shown equipment in course of manufacture.

OBITUARY

Mr. J. H. Rider.—The death of Mr. John Hall Rider, M.Inst.C.E., M.I.Mech.E., M.I.E.E., which occurred on 23rd April in his ninetieth year, has removed another of the pioneers of the early days of electricity generation and distribution, and also of electric traction, in this country.

The late Mr. J. H. Rider

Mr. Rider was born in Bristol, and he began to study electricity and magnetism in 1880 at the Bristol Trade and Mining Schools under Dr. Cook. In 1883 he was apprenticed to Paterson & Cooper, with whom he carried out lighting contracts in many parts of England and Norway. He was appointed electrical engineer to Blakey, Emmott & Co., Ltd., Halifax, in 1887, and for six years designed and superintended the manufacture of their dynamos and electric light plant generally. He became borough electrical engineer to the Bolton Corporation in 1893, for whom he carried out the electric lighting undertaking from his own plans and designs. He reported on a general electric traction scheme for the borough in 1896. He remained at Bolton until 1896 when he was appointed borough electrical engineer to the Plymouth Corporation. He designed and superintended the construction of combined works for electric lighting and traction in that borough. In February, 1901, he was appointed electric tramway engineer to the London County Council, and carried out the conversion of the whole of the Council's tramways from horse-drawn to electric traction. The Council's generating station at Greenwich, of 34,000 kW normal capacity, was built and equipped from his designs, together with a large number of substations. In 1901 he visited the United States and Canada (in company with the tramway manager) on behalf of the Council, to report on shallow underground tramways, and the subway between the Strand and Theobald's Road was the direct result of that visit. Both in 1906 and 1907 Mr. Rider assisted in the preparation of bulk electricity supply schemes promoted by the Council.

Mr. Rider left the London County Council's service in 1910 when he went to South Africa to take up the appointment of chief electrical and mechanical engineer to the Central Mining & Investment Corporation, Ltd. He returned to England in 1915 and took up a partnership in the firm of Preece, Cardew & Snell, which then changed its name to Preece, Cardew, Snell & Rider. Mr. Rider's first important work with the firm was in connection with the new Harbour power station at Belfast. This station had been largely designed by the late Sir John Snell, but on his appointment as Chief Electricity Commissioner, and his resignation from partnership in the firm, Mr. Rider undertook the completion of the work. New power stations at Nottingham, Norwich and Swansea were designed by Mr. Rider who at the same time was engaged on a survey of electricity supply in London on behalf of the London and Home Counties Joint Electricity Authority and the formulation of plans for the establishment of a super power station in the western part of the area. In conjunction with the late Mr. A. J. Fuller, he designed the Fulham power station (310,000 kW). His last major work was the new Kingston power station (123,000 kW) which was the first station to be opened after vesting day.

Mr. Rider's services were in great demand in the 1920s as an expert witness in arbitration proceedings in connection with electricity undertakings. He read several papers before various institutions. In 1909 he was elected to the Council of the Institution of Electrical Engineers, and in the following year was elected a vice-president. He was also a past-president of the Incorporated Municipal Electrical Association, which Association was

founded on his initiative in 1895. In addition, he served on Engineering Standards Committees.

Mr. W. G. Laxton.—The death occurred in Southend General Hospital on 16th April, at the age of forty-four, of Mr. W. G. Laxton, an executive of the Ekco Plastics Division technical staff. Mr. Laxton joined the company in 1944.

Mr. Charles Walter Eve, a former director of Standard Telephones & Cables, Ltd., and a director of Kolster Brandes, Ltd., whose death we briefly recorded in our last issue, was sixty-six years of age. He joined Standard Telephones & Cables, Ltd., in 1906 and, after working in the general departments of the company, he finally, in 1911, entered the Sales Department, and from that time, with one short break, his interests and activities with the company were on the commercial side. In 1915 he was given the task of establishing a Department to handle the domestic supply business and he spent some time in the United States.

He was appointed assistant sales manager in 1923, controlling the publicity and budgetary work of the company, and in 1928 he was given a special assignment to cover international information work. However, in 1930 he returned to his commercial activities and became general sales manager (later commercial manager) of the company. In 1940 he became a director of the company and assumed the title of commercial director, which post he held until his retirement in 1947. During the immediate post-war period he was one of a number of industrial experts who carried through the amalgamation of all the industrial associations of the radio industry. To this end, the major operation in which Mr. Eve played an outstanding part was the formation of the Radio Communication and Electronic Engineering Association. Under his guidance there was then established the Radio Industry Council. He was also closely connected with the formation of the Telecommunication Engineering and Manufacturing Association.

Mr. E. Riches.—The death occurred on 15th April of Mr. E. Riches, who until his retirement in March, 1946, was head of the British Thomson-Houston Co.'s Order Department at the Willesden works, which position he had held since March, 1927. Mr. Riches joined the B.T.H. Co. in 1900.

WILLS

Mr. E. A. Uttley, M.I.M.E., M.I.E.E., chief constructor and electric inspector to the Rhodesian Government for many years, who died on 27th December last, left £8,384 gross (£8,297 net).

Mr. E. Royle, formerly managing director of Bertram Thomas, electrical engineers, who died on 19th January last, left £23,977 gross (£21,688 net).

Mr. E. Croft, founder of Smith & Croft, electrical engineers and contractors, who died on 9th January last, left £5,356 gross (£5,279 net).

Mr. C. H. Dade, late director of the Electrical & Industrial Investment Co., Ltd., and a number of electricity supply companies, who died on 26th December last, left £73,953 gross (£72,985 net).

PARLIAMENTARY NEWS

By Our Special Reporter

IN the House of Commons last week Mr. Nabarro asked the Attorney General whether he had yet completed his inquiries concerning an illustrated publication entitled "The Place of Electricity in the Nation's Fuel and Power Policy," a copy of which had been sent to him, which purported to represent the views of the British Electricity Authority but carried no imprint of the body or persons issuing the document, and no imprint of the publishers or printers and thus constituted an offence; what steps had been taken to establish whether this document was published with or without the authority of the B.E.A. or by it; and what steps he was taking to establish the identity of the issuers, printers and publishers of the document to secure compliance with the law.

Sir Lionel Heald, in a written reply, stated that he had completed his inquiries and had given instructions for proceedings to be instituted against the B.E.A. for an infringement of the Newspapers, Printers and Reading Rooms (Repeal) Act, 1869.

Fireguard Regulations

Mr. Erroll asked the Home Secretary what representative bodies he consulted before issuing S.I. No. 526 of 1953 [The Heating Appliances (Fireguards) Regulations].

Sir David Maxwell Fyfe said the answer was the British Electrical and Allied Manufacturers' Association, the Electrical Wholesalers' Federation, the Oil Burning Apparatus Manufacturers' Association, the National Federation of Ironmongers and the Society of British Gas Industries.

Promotional Advertising

Mr. Palmer asked the Minister of Fuel and Power if, in view of the obligation placed by Parliament upon the nationalized electricity supply industry to balance its outgoings by its revenue, he would relax his restriction upon promotional advertising by the industry.

Mr. Geoffrey Lloyd said he was at present discussing future publicity arrangements with the gas and electricity industries.

Institute of Fuel

Luncheon and Presidential Address

THE annual luncheon of the Institute of Fuel was held on 23rd April with the president, Dr. G. E. Foxwell, in the chair. After the loyal toasts, the president announced that the Duke of Edinburgh had accepted honorary membership of the Institute. He then presented the Melchett Medal for 1953 to Dr. Harold Hartley, C.B.E., in recognition of his work in improving fuel-consuming appliances in the home.

The Minister of Fuel and Power (Mr. Geoffrey Lloyd), proposing " The Institute of Fuel," suggested that it should adopt two worthies: Benjamin Franklin, who in the eighteenth century observed that smoke was a sign of inefficient combustion, and Stanley Jevons, who about 100 years ago foresaw that because coal was a wasting asset its export could not progressively be continued. Coal was also becoming more difficult to get. In 1870 fuel production in the United States was only one-eighth of that of the United Kingdom; it became equal at the turn of the century and was now more than twice as much. Production in Soviet Russia was also increasing rapidly. The chief task of the fuel technologist was to improve efficiency in the use of fuel.

Responding, the president outlined the principal lines on which fuel economy investigations were proceeding and expressed the view that the life left to British mines would not greatly exceed 150 years. The Institute was an independent body which served both fuel technologists and fuel users. Its membership qualifications were high, it had an expanding scientific journal and its meetings were open to all. Many times the present number of fuel technologists were needed and, in addition to the 4,000 members of the Institute, at least 12,000 more should be employed by industrial concerns.

The toast of " The Guests " was proposed by Sir John Charrington, who included a reference to Mr. Hobbs, this year's student medallist. While holding that nationalization of the fuel industries could not be undone he considered that those in executive charge ought to be allowed to get on with the job free from political interference, which expressed itself in a desire to pull the industry up by the roots to see how it was growing.

In his response, Mr. H. F. H. Jones (deputy chairman, Gas Council) said that fair and constructive criticism was to be welcomed, but he deprecated any tendency towards political day-by-day interference, which was likely to harm the reputation of the industries and so discourage recruitment of young men of the right type. In the course of an account of the present position of the gas industry, he pointed out that the relatively scarce carbonization coals, suitable for gas and coke production, were being diverted wrongly to industry and to domestic uses.

Dr. Foxwell's Address

The address of the president, Dr. G. E. Foxwell, was delivered at the annual corporate meeting, which was held before the luncheon. Under the heading of " Fuel and Society," the president traced the technological, social, economic and political consequences of the industrial revolution that resulted from the application of the energy of coal to manufacturing processes. The result, he said, was a transition from the sturdy individualism of *laisser-faire* to the herd mentality of collectivism. Whatever the form of political theory, it could survive the test of experience only if it encouraged to the full the spirit of enterprise. There might, however, be sound practical reasons for State co-operation (not necessarily ownership) in industry.

The carbonizing industries were concerned about the reserves of coking coal and a substitute for coal must be found within the next century, as without supplies of energy (probably the most important problem facing this country) our civilization would end.

The present position was as difficult as that which followed the Napoleonic wars,

but we were better organized to meet it with established basic technologies. Goods exported should involve the maximum difference in cost between raw materials and finished articles, e.g., iron and steel. The advisability of exporting coking coal should, therefore, be considered. The cost of fuel in many important industries was only a small proportion of the total costs and the requisite improvements in economy were unlikely on a voluntary basis. Compulsory inspection, as for other purposes, by paid inspectors might be necessary to ensure proper fuel utilization. Much greater capital expenditure on new plant was needed to maintain full employment; i.e., large-scale long-term projects only possible on a national scale, such as hydro-electricity or railway electrification, and the planning ahead of smaller schemes by individual firms. Had the Severn Barrage scheme been proceeded with in the early 1930's it would by now be highly profitable. Owing to increasing use of energy in factories, greater emphasis was now placed on training and education, and a higher proportion of technical staff to manual workers was required.

B.E.A.M.A. Annual Meeting

THE forty-second annual general meeting of the British Electrical and Allied Manufacturers' Association was held in the Connaught Rooms, London, on 16th April.

In his statement the retiring chairman, Mr. T. F. Lister (chairman and managing director of the Hackbridge and Hewittic Electric Co., Ltd.), gave a warning that trading conditions in the future would be more difficult than for years past. Many firms, he stated, were living on the arrears of orders received during more prosperous times.

With regard to the export situation, Mr. Lister noted that, with the expansion of British production capacity, exports would have to form a considerable portion of output if full employment was to be maintained.

Commenting on the recent Budget proposals, Mr. Lister said, "While no doubt we should all have welcomed more generous terms, it is refreshing to see a downward turn in the heavy burden which the country has had to bear for so many years. The reductions in purchase tax on washing machines, refrigerators, vacuum cleaners, radio and television sets, etc., the reduction of 6d in the standard rate, the re-introduction of initial allowances on plant and buildings even at a lower rate than formerly, and the abandonment of the excess profits levy from January next are encouraging . . . and should prove a stimulus which is much needed in the more competitive conditions which lie ahead."

A summary of the Association's report for 1952 appeared in our issue of 17th April.

British Electricity Scholarships

LAST year the British Electricity Authority and the fourteen Area Boards launched a scheme whereby twelve scholarships were offered each year to employees for full-time studies at a university or college for periods from six months to three years. Six are allocated to manual workers and six to technical, clerical and administrative staff.

Scholarship holders are selected by the Scholarship Committee of the National Joint Advisory Council, which consists of four Electricity Board members, Sir Henry Self, Messrs. H. H. Mullens, H. J. Randall and C. W. Marshall, and four trade union representatives, Messrs. R. G. Cook, A. M. F. Palmer, L. G. Moser and A. E. Morgan. Sir Robert S. Wood, until recently vice-chancellor of Southampton University, sits on the Committee as academic assessor and senior representative of the universities.

In 1952, 248 applications were received, 96 being from technical, 77 from clerical and administrative and 75 from manual employees, and awards were made to the following:—

Manual Workers.—Messrs. R. H. Aldham-Hughes (acting chargehand electrician, South Eastern Board), B. H. Davolls (contract electrician, Eastern Board), G. S. Franklin (electrician, Eastern Board), J. A. Hope (electrician, South Eastern Board), R. H. J. Leaney (electrical fitter, South Eastern Board) and E. Prince (static substation attendant, North Western Board).

Technical, Clerical and Administrative Employees.—Messrs. P. D. Avlett (second assistant engineer (system development), South Eastern Division), R. W. Diggens (senior clerk, South Eastern Board), M. A. Shepherd (junior engineer, North Western Board), J. M. Russell (second assistant engineer, South West Scotland Board), K. H. Hughes (administrative section head, South Wales Division) and J. E. M. Watts (senior assistant (finance branch), Central Authority Headquarters).

Domestic Socket-Outlets

The Future of the 13 A Pattern in Ring Circuits

By R. J. COURTENAY

THERE has recently been issued, but not generally distributed, an illustrated leaflet[1] specially designed for the guidance of architects concerned with domestic electrical specifications. Part of the leaflet very concisely summarizes the application and advantages of the ring circuit system of house wiring.

As B.S. 1363 is now five years old, sufficient time would seem to have elapsed in which to assess the extent to which the purpose of that Standard has been fulfilled and to consider its future in the light of present practice. It is appropriate, however, first to survey briefly the early beginnings so that one may consider the 13 A at 250 V socket-outlet in its proper perspective against the background of earlier standards.

The cover of the leaflet bears a graphic diagram of a typical ring circuit printed over the background of a new housing scheme, which reminds us that B.S. 1363 was born out of the conception of a universal plug and socket primarily for domestic use, as recommended by Post War Building Studies No. 11 of 1944. The progenitors of the new socket intended it as an answer to the problems of providing adequate yet economic electrical installations for post-war homes; and the modification of the I.E.E. Wiring Regulations in 1950 to allow the use of a ring circuit " in private houses or residential flats and other installations where the application of a diversity factor can be justified " provided the means of applying it.[2]

If the Standard is to achieve this aim, obviously the sooner it is adopted on a wide scale the better. At the same time it must not be claimed, of course, that B.S. 1363 will take the place of B.S. 546, or that it was intended to do so, although for its particular purpose the ring circuit system has distinct advantages both of convenience and economy.

The leaflet shows to what extent the manufacturer has supported the Standard since its publication. B.S. 1363 as it was issued in 1947 provided only for a flush pattern unswitched socket-outlet and,

[2] I.E.E. Regulation 201 (B) Exemption (iii) specifies conductors of not less than 0·0045 sq in cross-sectional area (7/·029 in) or of 0·003 sq in in the case of mineral-insulated metal sheathed cables.

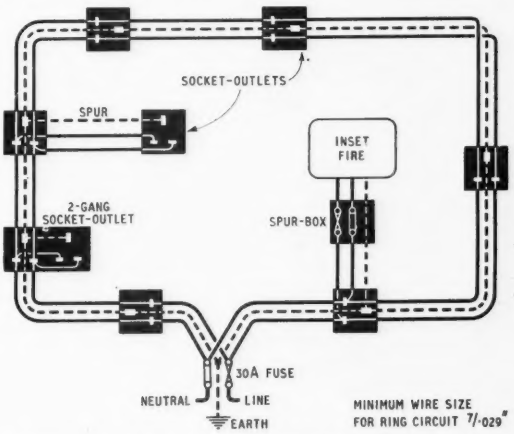


Diagram of a typical ring circuit (adapted from the cover of the leaflet referred to in this article)

[1] Leaflet No. 222, M.K. Electric, Ltd.

although it was announced at the time that another Standard for switch socket-outlets was contemplated, nothing has so far matured. There is, nevertheless, now available to suit the standard rectangular pin plug a wide range of accessories whose scope is far in excess of the meagre provisions of the B.S. itself; and the contractor who wishes to provide a ring circuit with outlets suitable for a variety of applications has at his disposal socket-outlets and switch socket-outlets for flush and surface mounting, both all-insulated and metal-clad. Other introductions born of enterprise rather than the Standard are twin socket-outlets, a fused-plug embodying a fingertip switch, and fused spur-boxes for wiring fixed appliances on the ring circuit.

While it must be remembered that the principal field of application will always be in domestic work, there are occasions where a diversity factor can be justified and the system economically and conveniently applied elsewhere.

Compliance with B.S.

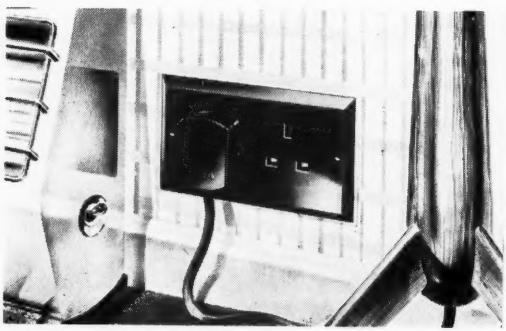
Many manufacturers have now produced designs to this Standard, which raises a most important point concerning the functions and limitations of B.S. 1363. Dimensions, certain materials and some tests are laid down in the specification but a good deal of variation in other respects is permissible, and this naturally applies most especially to the technical design of the product. Consequently it cannot reasonably be claimed that B.S. 1363 is a basic formula for the production of a good plug and socket. Yet such a misconception does exist, for the wording of many housing specifications implies that conformity to the Standard is the only criterion of suitability. If it were generally accepted that there was little to choose between one make of 13 A (3 kW) socket-outlet and another, there would be considerable danger of a general lowering of quality; for it is apparently possible to manufacture a socket conforming to the B.S. yet lacking many of the refinements of good design and workmanship. Against an inferior product made to a price, the better manufacturer would find it impossible to compete without detriment to quality.

This point can be confirmed by a simple comparison of the design of the current-carrying sockets in different makes of accessories. These vary from the sound engineering job, skilfully designed and made from the best and most appropriate materials, to components of inferior design and manufacture. The same thing can also be seen, perhaps even more obviously, in the design of shutter mechanisms, for, unlike B.S. 546 (which was revised in 1950), B.S. 1363 does not yet call for a test of the shutter action. The basic requirement of a good accessory is that in design and workmanship it must not only conform to the appropriate B.S. specification, but must stand up to the test of time.

These comments do not apply only to this particular British Standard. A recent editorial in the *Architects' Journal* makes the same complaint in more general terms concerning the possible influence that British Standards may have on standardization of design. That editorial[3] says "The B.S.I. is certainly aware of this danger and does now attempt to give Standards in terms of performance, but there are still some Standards in existence which do not avoid this danger. A second complaint is that a widely accepted standardization of quality must mean that Standards will be scaled down to meet the minimum quality for low cost building."

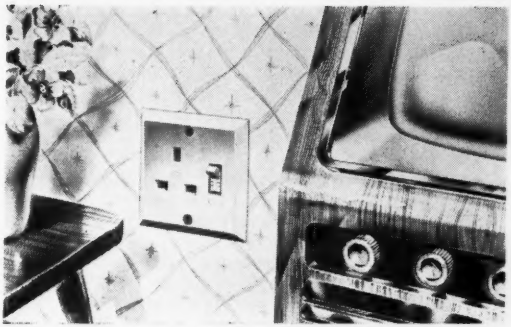
Let it not be thought that this is a suggestion for more rigid specifications. On the contrary, the spirit of

As easy to install as a one-gang unit, the twin socket-outlet solves the problem of feeding two appliances from one position



[3] *Architects' Journal*, 23rd October, 1952, p. 485.

individuality is essential to a healthy, competitive industry and can best be encouraged by the continued discrimination of contractors and consultants: for it is, after all, owing to such discrimination in the past that the quality of British-made electrical accessories is the highest in the world to-day. But when the user ceases to insist on high quality, or fails to understand that conformity with a B.S. is not necessarily a guarantee of such quality, then these standards will be in danger of falling away.



This compact switch socket-outlet is one of a comprehensive range of accessories designed to fit into the B.S. 1363 box

While it is important that the use of the ring circuit system should be encouraged wherever it is appropriate, it is just as important that it should in these cases be applied properly. This premise raises the question of the number of socket-outlets which it is desirable to provide on domestic properties. The application of a diversity factor is surely intended to allow a really generous number of outlets to be installed. This is, after all, the Electrical Age, and we must not hesitate to think in such terms and to make full provision for the enjoyment of its benefits. Unfortunately it does seem as if traditional practices still influence the wiring installation of to-day. The householder living in a property " put up " pre-war by a speculative builder may consider eight socket-outlets to be generous equipment for the post-war Council-sponsored dwelling. Such a comparison is entirely fallacious. Changing modes of living demand changed outlooks: new wiring regulations call for new specifications. In a nutshell, one of the main advantages of the ring circuit system is nullified if outlets are not provided on the recommended scale.

Direct acquaintance with very many specifications which intended the ring circuit system to be used produces the general impression that an average of seven or eight outlets is being provided in a three-bedroom dwelling. The most lavish specification of this kind, apart from private work, calls for thirteen or fourteen outlets. At the other (dismal) end of the scale, houses are being built with but four outlets. Imagine the predicament of a tenant in a living room with only one outlet: when he wants to switch on the table-lamp he has to turn off the radio! The inevitable outcome of such a situation was the introduction of 13 A adaptors. Critics may condemn this practice in principle, but the demand for such a product can fairly and squarely be laid at the door of those responsible for the meagre specifications cited above.

Domestic Installation Recommendations

The recommendations of Post War Building Studies No. 11 (1944) on this subject were most reasonable, yet, despite the careful investigations which prompted them, they have been almost universally ignored. The following *minimum* number of outlets were recommended for small houses and flats:—

Living rooms: 3 standard socket-outlets
Double bedrooms: 3 standard socket-outlets
Single bedrooms: 2 standard socket-outlets
Kitchen: 3 standard socket-outlets on the ring circuit (one of these may be omitted in kitchens not intended for use as a living room).

Thus, in a three-bedroom house with two living rooms the minimum number of outlets recommended is sixteen.

We quote (without comment) from Clause 142 of the same publication: " *General Domestic Purposes*—As a minimum provision, which would meet most requirements, it is recommended that one socket-outlet should be provided in every room wall space exceeding 3ft in length, with additional outlets in longer walls placed so that no point along the floor line is more than 6ft from an outlet. These socket-outlets should

be of the proposed Standard type. From thirty to fifty of these socket-outlets would be required in a typical detached self-contained house of the larger type."

If we approach this subject realistically we should not lose sight of the main purposes of the system, which can be summed up as follows:—

1. To provide standard outlets of one gauge throughout the home.
2. To provide a sufficient number of outlets to allow for the full use of the wide variety of electrical appliances which play a part in modern living.
3. To site the outlets in such a way as to avoid the use of adaptors and long flexible cords.
4. To plan in such a way as to avoid the need for any subsequent alterations to the wiring installation.

The recent report of the Committee sponsored by the Ministry of Housing and Local Government on "Quicker Completion of House Interiors" has already been mentioned in the *Electrical Review*,[4] but one cannot resist requoting in this context the Committee's recommendation that "whatever system is adopted it is important that the number of light and power points in a house should be kept to a minimum." It is not difficult to guess what will be the interpretation of "minimum." Thus have we progressed from 1944 to 1953!

If the ring circuit is carried through each room of the dwelling, it will be very simple to provide outlets to conform to these principles. Before the modification of the I.E.E. Wiring Regulations to permit this to be done, the installation of 15 A at 250 V socket-outlets involved long runs of cable (and conduit) from separate positions on the household distribution board. In consequence, when the cost of a particular installation seemed likely to be too high, a very real economy could be made by reducing the number of outlets. With the ring circuit an economy of this kind is unjustifiable, since the main cost is in the provision of the circuit itself and not the individual sockets. Once this fact is fully realized, there will be a better chance of new homes having a really generous number of outlets installed.

The conclusion is that the 13 A (3 kW) socket-outlet is here to stay. If we accept this as a fact, we must apply ourselves to the task of using it as appropriately as possible. It seems fairly certain that in about ten years' time there will be a small number of towns in this country where every home is equipped exclusively with the Standard socket. If only from the local electrical retailer's point of view, how great a saving there will then be in labour, administration and tempers! The recent news of the lifting of licensing restrictions for new building is unquestionably a great opportunity to take full advantage of this system. There is, however, an obvious danger that electrical specifications for the £2,000 house may be severely pruned in order to keep costs down. Let us hope that the contractors who do this work will be able to persuade their clients that cheese-paring on the electrical work is a false economy and that the ring circuit, correctly applied, can fulfil their needs in an efficient and inexpensive way.

In the meantime one welcomes every endeavour to provide guidance to those who draw up the specifications. Nevertheless, one is bound to feel that so important a matter should not be left entirely to the enterprise of individual manufacturers. If the Government-sponsored recommendations were worth making, then they are also worth implementing. It will be remembered that in 1948 the then Minister of Supply appointed a Committee under the chairmanship of Sir Ernest Lemon to report on standardization in the engineering industry. One of the chief recommendations made was that, wherever possible, the Government should ensure that its Departments, the nationalized industries and other public bodies made purchases to British Standards. Now that B.S. 1363 has met with wide acceptance the continued use of non-standard sockets, whether of 13 A or other ratings, is bound to have a weakening effect on an overall policy of standardization, quite apart from maintenance problems in the years to come. The future of this Standard, therefore, can be influenced to some extent by housing authorities' attitude to the Lemon Report.

[4] *Electrical Review*, 6th March, pp. 504 & 510.

E.I.B.A. East Midlands Ball

THE East Midlands Area Committee of the Electrical Industries Benevolent Association announces that it will be holding a Coronation Year ball at the Palais-de-Danse, Leicester, on 3rd December. The organizer of the function is Mr. J. B. Taylor, G.E.C., Queen's Building, Rutland Street, Leicester.

Pure or Applied Science?

Forty-Fourth Kelvin Lecture

At an ordinary meeting of the I.E.E. on 23rd April the forty-fourth Kelvin Lecture under the title of "The Dilemma of Lord Kelvin" was given by Professor P. I. Dee, C.B.E., M.A., F.R.S., the present occupant of the Kelvin Chair of Natural Philosophy at the University of Glasgow. Professor Dee said that when at the age of twenty-four the then William Thomson was appointed to the Chair of Natural Philosophy at Glasgow, he had already decided his life's supreme task. Feeling convinced that all the branches of physical science were essentially based upon dynamics, he had set himself the task of evolving an all-embracing theory which would afford a dynamical explanation of mechanical, optical, electrical and magnetic qualities by the arrangement and mutual actions of molecules or by structural concepts of molecules or by their relation to an all-pervading ether.

During the next five years, from 1847 to 1852, Thomson's main interest lay in thermodynamics, but he also published many papers giving a comprehensive and formal analytical development of the mathematical theory of magnetism, in which the concept of magnetic inductive capacity (susceptibility) appeared for the first time. The publication in 1853 of a paper entitled "On Transient Electric Currents" marked the beginning of a new phase. In that paper he gave the approximate specification of the oscillators with which Hertz thirty-four years later first generated electromagnetic waves in the laboratory and also considered the rise of current in a conductor to which an e.m.f. was suddenly applied.

Submarine Cable Project

In 1854 his attention was directed to the experiments of Latimer Clark on the retardation of signals in submarine telegraphy. By 1856, when the Atlantic Telegraph Company was formed, Thomson had published several papers upon this subject and was elected a director of the company. Thus Thomson became the foremost exponent of the application of physics, deflecting his main endeavour from the task in pure science which he had envisaged in his youth and in which he had shown such outstanding ability and promise. This conflict between the claims of pure science and those of scientific applications was the subject of the present Lecture.

Thomson found the cable project of absorbing interest, and its ultimate success added so greatly to his prestige that for the rest of his life ever-increasing claims of a technical character were made upon his time and energy, his advice being sought upon innumerable developments of electrical technology all over the world.

Indirect Consequences

The value of the cable project was obvious, but it had also certain important subsidiary consequences. With much difficulty Thomson persuaded the cable company of the need for a specification of conductivity in the cable contracts. When the contractors declared this to be impracticable Thomson himself supervised the setting up of electrical testing apparatus at the factories. That was probably the first introduction of proper scientific specification into electrical engineering practice and also perhaps the first introduction of physical testing laboratories into factories engaged in electrical manufacture. Another important consequence lay in the impetus which he gave to the design and manufacture of sensitive electrical measuring instruments. Thomson developed greatly improved designs of galvanometers and applied the device of a rotating mirror to magnify the magnet deflection. A third consequence was the use he made of university students to assist him in his researches, which led to the formal teaching of experimental physics at Glasgow—probably the first university to institute such training, now rightly regarded as an indispensable feature of a scientific education.

Kelvin failed in his quest for a compre-

hensive theory, no doubt partly because of the unlimited character of the problem. His lack of progress in pure science in his later years, however, must also be attributed in some measure to the absorption of his time and energy in the applications of science and to the practical attitude of mind which was fostered and developed by his successes in this field. There was no doubt about the importance and permanence of Kelvin's major contributions in the field of pure science, but, great though his reputation as a pure scientist might justifiably be, the best short assessment of the overall character of his work was probably that made by the President of the American Society of Civil Engineers at the Kelvin Jubilee, when he said: "We recognize in Kelvin the great leader who brought together pure science and applied science, who brought the profoundest conceptions of science into the service of the constructive arts."

Before the delivery of the Kelvin Lecture, the President (Col. B. H. Leeson) presented to Sir Harry Railing, D.Eng. (Past-President), a certificate of honorary membership of the Institution, and to Sir Stanley Angwin, K.B.E., D.S.O., B.Sc.(Eng.) (Past-President), the Faraday Medal for 1953.

Sir Harry Railing, in thanking the Institution for the honour, said that he had chosen electrical engineering as a career because it appealed to him as a philosophy. It gave an opportunity to add something to the knowledge of matter and to extend the use of natural resources, and perhaps to find some further application of electrical energy, thus contributing to the progress of mankind.

In acknowledging the presentation of the Faraday Medal, Sir Stanley Angwin said he had been fortunate in that his period of service in the British Post Office had coincided with a tremendous advance in radio, telephony and telegraphy, and in long-distance transmission both by radio and by line. In the Post Office he had received every encouragement in his efforts to develop the art of telecommunication, and he paid a tribute to his colleagues.

BOILER EXTERNAL DEPOSITS

FOUR new publications have been issued by the Boiler Availability Committee. The first of these, bulletin MC/234, is a further interim report of investigations carried out between 1946 and 1951 into external deposits and corrosion in power station boiler plant. It is an extension of an earlier report, MC/135, which together with other bulletins and technical papers covered the period 1939 to 1946.

Among the aspects dealt with are the importance of cleaning "down to the base metal," the influence of sulphur and other impurities and the effects of auxiliary pulverized-fuel firing, flue-gas recirculation and reactive dusts; the more fundamental work with laboratory and pilot equipments is also briefly described. Summaries of papers on the subject by members of the Committee and of other papers published throughout the world are given in MC/235 and MC/236.

The fourth document mentioned is a group report (technical paper No. 3) on the relationship between chlorine content of coal and availability of a stoker-fired boiler in the Burton power station; with 0·95 per cent chlorine the running period was limited by deposits formed on the superheater to 532 hours, whereas with 0·03 per cent chlorine the run was extended to twelve months, while the value of operating consistently on one type of coal was demonstrated.

The Boiler Availability Committee, which was set up in 1942, is now financed by the Water Tube Boilermakers' Association and the British Electricity Authority, whose own field work is supported by long-term research at the Fuel Research Station of the Department of Scientific and Industrial Research and by the British Coal Utilization Research Association. The Committee does not issue its publications direct. Those interested should apply for copies to the manufacturers of the water tube boilers operated in the power stations.

COMMERCE and INDUSTRY

President Eisenhower Discusses Plant Contract

Power Engineers and Time Recording

AT his weekly Press conference President Eisenhower replied to questions about the rejection of the English Electric Co.'s tender for generating plant for the Chief Joseph Dam although it was about a million dollars below the lowest American bid. The President said that the matter had been dealt with very properly by the Secretary for Defence, Mr. Charles Wilson, who had decided that the bids should be rejected and reopened because there was nothing in the specifications to show that there was equivalent quality in two items on which the bids were submitted. The specifications were now being rewritten and there would be nothing in them to exclude British bids, but the Administration did want to make certain, in view of technical advice it had been given, that it was getting items of equal quality and equal suitability for the purpose. Generally speaking, if a British bid was substantially the most favourable it would be accepted.

A.E.M.T. Convention

The annual convention of the Association of Electrical Machinery Trades was held at the Queen's Hotel, Eastbourne, from 19th to 21st April and there was a record attendance of delegates with their ladies. Two papers, "Fibreglass Electrical Insulation," by Mr. A. R. Henning, and "The Application of Electrical Power Drives to Machine Tools," by Mr. F. H. Schroeder, aroused considerable interest, while on the social side a dinner and dance held in the evening of the second day proved a popular function. The accompanying picture was taken during the convention.

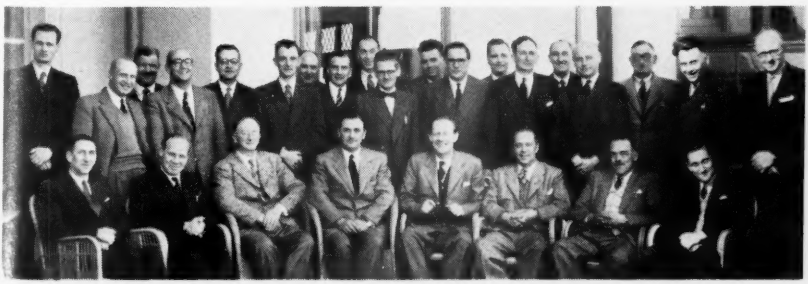
Nottingham Electrical Club

At a meeting held at the County Tavern, High Pavement, Nottingham, on 13th April, Mr. W. K. Martin in the chair, it was decided to form an Electrical Club in the city. Its objects are to foster close co-operation between the various sections of the industry, to participate in social activities, hold lectures and to have discussion groups, arrange works visits, etc. The meeting was well attended and included many well-known people from the various sections of the industry, including wholesalers, contractors, works engineers, Electricity and Coal Board representatives and consulting engineers. It was agreed to name the club the Nottingham Electrical Club. The following officers were elected:—President-chairman: Mr. W. K. Martin; vice-president, Mr. F. N. Crabtree; secretary, Mr. J. D. Furse; and treasurer, Mr. R. Ellis. Information and particulars of membership can be obtained from Mr. J. D. Furse, Traffic Street, Nottingham.

Export of Metal Goods

The export of some copper and iron and steel goods to any destination other than China, Hong Kong, Macao or Tibet under open general

Delegates who attended the annual convention of the Association of Electrical Machinery Trades held last week at Eastbourne



licence is now permitted if the value of the goods exceeds the value of the copper, copper alloy, iron or steel content, calculated at the rate of £380 per ton for copper, £250 per ton for alloys mainly of copper, and £30 per ton for iron and steel. These licences apply to goods specified in Group 6 (2) of the First Schedule to the Export of Goods (Control) (Consolidation) Order, 1953. Under similar previous licences, which are revoked, the values were £430 per ton for copper, £350 per ton for alloys mainly of copper, and £40 per ton for iron and steel. The reductions in the minimum values have been made in order to facilitate the export of certain ranges of copper, copper alloy and iron and steel manufactures.

Industrial Relations Exhibition

As a means of acquainting the people at their Thorncliffe (Sheffield) Works of their part in the organization in relation to one another Newton, Chambers & Co., Ltd., have arranged an " industrial relations " exhibition-demonstration at the works. The exhibition will be permanent, but changing in presentation as necessary. Three aspects are dealt with in the exhibition. First the historical background of the works is illustrated by means of maps and photographs. Then there is a section devoted to the work carried out at Thorncliffe, including the production of gasworks and coke-oven plant, excavators, chemical process equipment, etc.

The third section is devoted to the people in the works and shows the company's training schemes; welfare, educational and cultural services; and facilities for recreation. Stress is laid on the encouragement of handicraft.

Radio Sales Aid

An elegant red and gold cut-out, for use in dealers' showrooms and windows, is the principal feature of Mullard's Coronation display material. Measuring approximately 12in by 9in, it invites the public to ask for a demonstration of the radio and television receivers equipped with Mullard valves and " long-life " picture tubes. The invitation card is hand lettered and the border (including the crown) is gold-embossed. The lettering on the base of the display is in gold against a red velveted background.

Contract Price Formulæ

The British Electrical and Allied Manufacturers' Association has issued the figures for its contract price adjustment formulæ. In each case the rate of pay for adult male labour at 18th April is deemed to be 141s 6d. The " cost of material " figures are as follows:—

For electrical machinery and equipment: the Board of Trade index figure published on 18th April is 160·4.

For turbo-generating and allied plant: materials used in mechanical engineering industries, 147·9; blast furnaces and iron and steel smelting and rolling (40 and 41), 143·5; price of ⅜in o d 18 s.w.g. brass condenser tubes (*Metal Bulletin*, 17th April), 3s 10¼d.

Outstanding contracts covered by the Board of Trade intermediate products index: The index figure for intermediate products (18th April) is 344·2.

Firth Cleveland Showroom

Last week the Firth Cleveland Group (chairman, Mr. C. W. Hayward) opened a new London showroom at Byron House, 7–9, St. James's Street, S.W.1. There a diverse display has been arranged of the products of the companies of the Group. Prominent among them is Simmonds Aerocessories, Ltd., whose exhibits include numerous examples of self-locking nuts—all-metal and with fibre and nylon inserts; " Spire " speed nuts of many patterns for rapid fastening; pressure and fuel gauges, including the " Pacitor " electronic fuel gauge; and a range of " Fram " oil, petrol and water filters. Electric vulcanizing machines for dealing with repairs to tyres, rubber belting and rubber-covered cables are shown by Stenor, Ltd. The other companies concerned are British Lead Mills, Ltd., and British Lead Alloys, Ltd., which produce lead sheet and piping, lead sleeves for cable jointing and a wide range of solders; the

The new Firth Cleveland London showroom

Firth Co., Ltd. (steel wire and wire products); and Firth Cleveland Machine Tools, Ltd. (small lathes, drilling machines, boring bars, jigs and tools, etc.).

The Group has a number of associated manufacturing and distributing companies in overseas countries.

Time Recording

A notice appearing in the April issue of the *Electrical Power Engineer* states that the Electrical Power Engineers' Association has informed the British Electricity Authority of its decision to resist time recording so far as members of the technical staff are concerned. It is pointed out that the National Joint Board Agreement provides that its members shall be available in certain circumstances outside normal hours of work and they are not paid for overtime. The arguments which may properly be adduced in favour of time recording for clerical staff, whose agreement differs from the N.J.B. Agreement in both these respects, are held to lack validity so far as the technical staff is concerned.

Tinplate Workers' Essay Competition

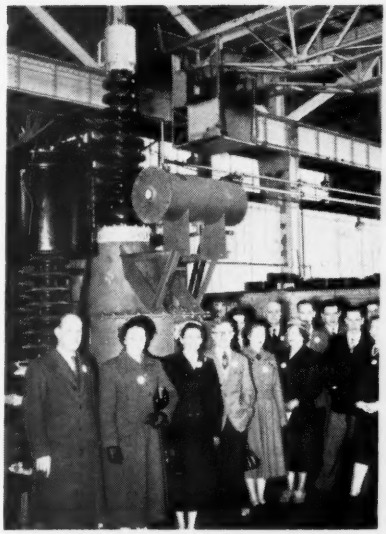
The Worshipful Company of Tinplate Workers *alias* Wire Workers of the City of London, announces that the first place in the Essay Competition amongst those who received Travelling Scholarships for 1952 has been awarded to Alan Leslie Powell (W. T. Henley's Telegraph Works Co., Ltd.), presented by the Cable Makers' Association, who went to the Metropolitan-Vickers Electrical Co., Ltd., Manchester, for his tour. The second place goes to Peter Gordon Tomlinson (Kayser, Ellison & Co., Ltd.), presented by the British Steel Wire Industries Association, who made his tour with Yarrow & Co., Ltd. The third place is awarded to James Duncan Waters (Mirrlees Watson Co., Ltd.), presented by the British Electrical & Allied Manufacturers' Association, who made his tour with W. T. Henley's Telegraph Works Co., Ltd.

The Court expresses its thanks to the editors of the *Electrical Review* and the *Ironmonger* for again acting as assessors.

B.T.H. Parents' Day

On 18th April parents of apprentices in their first year with the British Thomson-Houston Co., Ltd., Rugby, had the opportunity of visiting not only the works, including the various apprentice training establishments, but also the Rugby College of Technology and Arts, as well as the B.T.H. apprentice residences, "Coton House" and "The Laurels," together with the Laurels Apprentice Association Club.

After tea at Coton House the assembly, which included over 250 parents, moved to the dining hall for the official welcome by Mr. H. L. Satchell (director, manager B.T.H. Rugby Works), who introduced the speakers, the Mayor, Councillor W. A. Robotham, Mr. L. J. Davies (director of research and education B.T.H.), and Miss D. S. Hodson (staff lady supervisor B.T.H.). The proceedings concluded with a display by the Coton House Fire Brigade.



A group in the B.T.H. transformer factory, Rugby, taken during the annual parents' day

E.C.A. Branch Dinner

The annual dinner of the Hull and East Yorkshire Branch of the Electrical Contractors' Association was held recently at the New York Hotel, Hull, under the chairmanship of Mr. F. Broadhead. Replying to the toast of "The City of Kingston-upon-Hull," the Lord Mayor (Councillor A. K. Jacobs) attacked Socialist members of the Hull City Council for allowing electrical and other contracts in connection with the new Hull Technical College to go out of Hull. It was better by far to give the work to a local firm at 10 to 12 per cent more than to let it go out of the town. Only three Hull firms had been asked to tender and he believed there were another dozen firms who could have submitted prices had they been given the opportunity.

Proposing the toast of the Association, to which Mr. J. R. Halliwell (vice-president, E.C.A.) and Mr. L. C. Penwill (director and secretary, E.C.A.) replied, Mr. Dennis Bellamy (chairman, Yorkshire Electricity Board) said that he frequently heard complaints about charges for electricity in Hull. The price of electricity was now only 65 per cent above the pre-war level and the average price in Yorkshire

was not 20 per cent more than it was four years ago. Nationalization had come to stay and they should now make the best of it, and see that the public got the benefits of a good electricity supply.

The need for higher productivity was stressed by Mr. Penwill, who also urged vigilance in combating the sale of shoddy and dangerous appliances.

Cathodic Protection Agreement

F. A. Hughes & Co., Ltd., and Westinghouse Brake & Signal Co., Ltd., are collaborating and pooling their experience of the cathodic protection method of corrosion prevention and have established the "Guardion Service." This embraces the supply of "Guardion" and "Westalite" cathodic protection equipment, and offers full consultative and design facilities as well as surveys in the field. It is applicable to all forms of buried or water-immersed metallic structures. Full particulars can be obtained from F. A. Hughes & Co., Ltd., Cathodic Protection Division, Bath House, 82, Piccadilly, London, W.1.

Prices of Materials

In the accompanying table we give the prices of the more important materials used in the electrical industry. The figures are those quoted on Monday last.

ALUMINIUM Ingots	ton £161 0s 0d
COPPER, H.C. Electro	ton £253 0s 0d
Fire Refined 99·70 per cent ..	ton £252 0s 0d
Fire Refined 99·50 per cent ..	ton £251 0s 0d
COPPER Tubes	lb 2s 7½d
Sheet	ton £3 16 10s 0d
H.C. wire and strip	ton £312 5s 0d
LEAD, English	ton £78 10s 0d
Foreign	ton £77 0s 0d
MERCURY	flask £70 10s 0d
TIN	ton £720 0s 0d
ZINC, G.O.B. Foreign	ton £66 0s 0d
*Electrolytic	ton £67 10s 0d
BRASS Tubes	lb 2s 1¼d
Sheet	ton £260 5s 0d
Wire	lb 2s 7¼d
PHOSPHOR BRONZE	
Wire	lb 3s 11⅞d
RUBBER, No. 1 R.S.S. spot ..	lb 20⅞d–21d

Washing Machine Competition

During February and March Thor Appliances, Ltd., in conjunction with Colgate-Palmolive-Peet, Ltd., held a "Thor-Fab" competition, in which competitors were invited to visit selected local Thor dealers for demonstrations of the Thor Automagic "Spin-Dry" washing machine. Competitors were asked to place in correct order the six best features of the machine. As thirty-five competitors succeeded in giving the correct sequence, they were asked to add an additional feature. The winners were:—First prize, £100, Mrs. R. H. D. Sinclair, Welwyn, Herts; second, £50, Mrs. G. M. Whitmore, Gotham, Nottingham; and third, £25, Mrs. G. Birtwistle, Rossendale, Lancs. In addition gold watches were presented to the demonstrators. A further twenty prizes of £5 each and 450 consolation prizes of 10s each are being sent to the authors of 470 entries which in the opinion of the judges follow in order of merit. The judges were Dame Caroline Haslett, Miss P. L. Garbutt, and Mr. J. W. Barton (chairman, Thor Appliances, Ltd.).

A reception was held at the Dorchester Hotel, London, on Friday last at which the Earl of Limerick presented the prizes to the first three winners.

Fireguard Regulations

The British Electrical and Allied Manufacturers' Association emphasizes the fact that the new Heating Appliances (Fireguards) Regulations permit heating appliances made before 1st October this year to be sold or let until the end of September, 1954. Appliances covered by the regulations which are made after 30th September this year must be fitted with the appropriate guards.

Housecraft Conference

We regret that in our report of the E.D.A.–E.A.W. Housecraft Conference on 3rd April (page 759) the christian name of Miss Ena M. Eaves was incorrectly given.

Trade Announcements

British Insulated Callender's Cables, Ltd., announces that with effect from 4th May their Lincoln branch office will be transferred to 113, Canwick Road. The telephone number (Lincoln 654) will be unchanged.

Evans, Adlard & Co., Ltd., in collaboration with H. Reeve Angel & Co., Ltd., have formed a new company, **Technical Paper Sales, Ltd.**, which is now responsible for the sale of Evans, Adlard's filter paper, blotting paper, filter pulp, impregnating paper, base paper for plastics, etc.

The **Morgan Crucible Co., Ltd.**, announces that the Sales and Technical Departments of its refractories group are now operated from the works at Neston, Wirral, Ches.

Mr. L. E. Gates has joined the sales staff of Berry's Electric, Ltd., as representative for South London and the South Eastern Counties. He was previously with the South Eastern Electricity Board, Central Sussex Area.

Mr. C. L. Owen, 1-2, Castle Cottages, Longbrook Terrace, Exeter, Devon, has been appointed by **FitzGibbon & Murray, Ltd.**, as sales agent for all south west counties and South Wales.

From to-day (Friday), the address of the Newcastle office of **W. T. Glover & Co., Ltd.**, will be 34, Great North Road, Newcastle-on-Tyne (telephone : 26857).

OVERSEAS ELECTRICAL TRADE

Decline in Exports Continues in March

DESPITE the fact that March contained two more working days than February, exports of electrical apparatus and machinery continued to show a decline, the respective total values being £15,327,560 and £16,553,186. Incidentally the totals include two new classifications which we have not previously listed: electrical pottery and glassware, including insulators; and electrical conduit tubes and cased tubes. Compared with March, 1952, the month's export figures

TABLE I.—ELECTRICAL EXPORTS

Class	March, 1952	March, 1953	Class	March, 1952	March, 1953
	£	£		£	£
Telegraph and telephone cables and wires (submarine)	233,358	141,725	Insulating cloth and tape	141,745	38,307
Ditto, not submarine	708,259	760,130	Other insulating materials	122,607	50,980
Cables and wires, paper insulated	744,324	883,688	Unclassified electrical goods and apparatus	698,267	628,715
Ditto, rubber insulated	787,759	473,923	TOTAL, electrical goods and apparatus	10,368,401	9,179,130
Ditto, cotton, silk or artificial silk insulated	83,951	39,349			
Ditto, enamel, glass or asbestos insulated	84,165	100,501	Diesel driven generators, not exceeding 10 kW		85,983
Ditto, other	280,711	269,162	Ditto, over 10 kW to 65 kW	556,303	133,762
Commercial radio apparatus	660,906	843,900	Ditto, over 65 kW to 200 kW		78,258
Domestic radio apparatus	450,639	337,633	Ditto, exceeding 200 kW	169,648	96,130
Telegraph, telephone and signalling apparatus	1,493,686	1,565,002	Other generating sets	178,039	85,284
Loudspeakers and microphones	91,506	42,471	Generators and parts of generators	385,314	772,176
Radio, telecommunication and electronic apparatus components and parts, n.e.s.	608,315	438,945	Motors, railway, tramway and trolley-bus	—	19,677
Other radio, telecommunication and electronic apparatus	143,795	341,915	Ditto, other, not over ½ h.p.	259,538	98,781
Cathode ray tubes	5,899	10,149	Ditto, over ½ h.p. but under 1 h.p.	113,086	38,575
Other valves	303,924	204,788	Ditto, from 1 h.p. to 250 h.p.	557,128	435,407
Carbons	31,181	17,776	Ditto, exceeding 250 h.p.	84,030	68,670
Lamps, exceeding 24 V	100,180	63,195	Ditto, parts	88,112	155,287
Ditto, not exceeding 24 V	15,172	23,032	Converting machinery	14,574	26,694
Other lighting appliances	184,797	162,387	Transformers, including coils	1,073,485	1,262,115
Primary batteries	183,325	186,279	Mercury arc rectifiers	55,687	61,608
Parts other than carbons	60,067	25,765	Motor starting and controlling gear	207,791	252,036
Accumulators for motor vehicles	253,497	139,012	Switchgear and switchboards (not telegraph and telephone)	1,197,539	1,497,287
Ditto, traction	60,921	23,422	Electrical machinery, n.e.s.†	103,827	65,996
Ditto, radio	8,029	2,474	TOTAL, electrical machinery	5,374,101	5,233,726
Other portable accumulators	74,812	35,593			
All other accumulators	104,986	69,119			
Parts and accessories	98,199	53,633			
Cooking appliances	277,594	93,129	Washing machines (not exceeding 150 lb weight)*	761,012	211,300
Heating appliances	116,012	77,160	Ditto (over 150 lb but not exceeding 250 lb weight)*		105,129
Parts and accessories for cooking and heating appliances	94,359	84,293	Ditto, parts	48,796	13,349
Flat irons	81,836	50,398	Vacuum cleaners	194,247	125,770
Commercial electrical instruments	164,369	157,901	Ditto, parts	42,241	17,271
House service meters	142,826	80,763	Other electrically operated portable appliances	306,245	171,467
Time recorders and time switches	15,457	11,260	Portable electric tools	140,549	95,440
Other electrical instruments	105,010	170,979	Electrical pottery and glassware, including insulators	106,394	73,776
Electro-medical apparatus (not X-ray)	50,953	41,542	Electrical conduit tubes and cased tubes	26,953	101,202
X-ray apparatus, other than tubes and valves	45,593	35,169			
Vacuum tubes	85,078	71,884			
Permanent magnets	40,032	31,139	GRAND TOTAL	17,368,969	15,327,560

* Not separately distinguished in 1952. † The two figures are not comparable.

are £2,041,409 lower. The decline was general, only sixteen of the sixty-nine items listed showing increased business. These items included certain types of cables and wires; commercial radio apparatus; telegraph, telephone and signalling apparatus; primary batteries; certain electrical instruments; traction motors; mercury arc rectifiers; motor starting and controlling gear; switchgear; and electrical conduit.

Table II.—Distribution of Electrical Goods and Apparatus

Destination	March, 1952	March, 1953
	£	£
Channel Islands	42,281	30,269
Gibraltar	57,760	51,158
Malta and Gozo	17,225	85,447
Cyprus	25,751	20,349
Gold Coast	66,834	80,870
Nigeria	75,457	142,031
Union of South Africa	900,681	929,942
Northern Rhodesia	42,062	52,988
Southern Rhodesia	154,776	170,812
British East Africa	220,540	240,893
Bahrein, Qatar and Trucial Oman	32,672	124,342
Kuwait	33,518	112,206
India	848,980	935,114
Pakistan	341,739	102,071
Malaya	392,907	335,714
Ceylon	138,146	91,361
Hong Kong	171,156	201,967
Australia	1,103,742	664,138
New Zealand	821,215	786,685
Canada	325,725	353,209
British West Indies	73,910	128,586
Anglo-Egyptian Sudan	84,158	67,982
Other Commonwealth Countries	144,104	207,949
Irish Republic	344,610	186,515
Soviet Union	12,494	44,736
Finland	135,113	22,189
Sweden	436,540	208,868
Norway	173,592	144,409
Iceland	5,027	15,169
Denmark	134,076	61,888
Poland	19,631	22,755
Western Germany	53,192	76,415
Netherlands	245,635	246,342
Belgium	131,253	152,924
France	70,876	157,405
Switzerland	63,523	38,828
Portugal	141,225	78,545
Spain	51,624	29,949
Italy	110,180	183,152
Austria	21,874	36,259
Czechoslovakia	13,481	1,801
Yugoslavia	14,975	33,582
Greece	61,136	23,949
Turkey	131,993	84,646
Portuguese East Africa	11,701	17,017
Syria	33,339	20,592
Lebanon	72,490	31,097
Israel	67,090	123,436
Egypt	264,531	76,552
Arabia	38,927	30,286
Iraq	121,871	169,605
Iran	31,197	18,157
Burma	64,206	124,757
Thailand	23,621	94,453
Indonesia	14,770	73,614
China	133	5,045
United States of America	101,827	124,187
Colombia	50,671	21,292
Venezuela	76,550	120,637
Peru	43,791	19,361
Chile	27,660	43,891
Brazil	239,697	42,245
Uruguay	12,087	1,858
Argentine Republic	220,813	30,954
Other Foreign Countries	294,980	220,355
Total	10,368,401	9,179,130

An interesting feature of the exports of generating plant was the increased business with Canada (£160,218 compared with £10,062), India (£219,678 compared with £112,483) and Spain (£80,334 compared with £8,436). This was, however, more than counterbalanced by reductions in the sales to Australia (from £301,536 to £71,728), Pakistan (from £46,513 to £454), Norway (from £46,919 to £8,457) and Argentina (from £41,274 to £691).

The reduction of £285,497 in the value of exports of motors was attributable to a considerable extent to a particularly sharp decline in the demand for the smaller types. Australia's total purchases of all types of motors reached only £95,222, compared with £243,457 in March, 1951. Another notable drop occurred in exports to Norway (from £91,717 to £18,221).

Bigger buying by South Africa (£703,635 compared with £463,003), India (£336,273 compared with £280,037) and Malaya (£104,244 compared with £53,069) was largely responsible for a rise from £2,982,903 to £3,165,736 in the value of shipments of "other electrical machinery." There was a reduction from £52,910 to £6,384 in exports of this class of equipment to Pakistan.

Details of destinations of electrical goods and apparatus as a whole are given in Table II. With regard to individual items New Zealand, taking £202,821 worth, was easily the best customer for telegraph and telephone cables (not submarine), India taking the largest share of both paper insulated (£236,501) and rubber insulated cables (£62,647). India too (£77,692) was second only to Sweden (£84,608) in the list of buyers of commercial radio apparatus. South Africa took £66,344 of the £337,633 worth of domestic radio apparatus disposed of, while of the £1,565,002 worth of telegraph, telephone and signalling apparatus exported New Zealand and South Africa accounted respectively for £288,218 and £268,091 worth. Only Malaya (£21,562 compared with £20,965) bought more accumulators. To Australia's reduction of purchases from £175,285 to £20,617 may be attributed most of the drop from £487,965 to £254,882 in exports of cooking and heating apparatus.

CORRESPONDENCE

Letters should bear the writers' names and addresses, not necessarily for publication. Responsibility cannot be accepted for the opinions expressed by correspondents.

Committees

IN your report of the A.S.E.E. annual dinner (17th April issue, page 867) Sir David Brunt is credited with a lunge at committees, saying that their domination of us is a menace. Sir David is always refreshing in his conversation and almost always given to humour and to sympathy with those occupied in large organizations. It will be our own fault if we are threatened by our own tools. We have to learn to use committees so that the action that they lead to is wiser than would be the action of any of their members.

Much thought is being given to the subject. The paper by Mr. R. Peddie of the United Steel Companies in the *British Management Review* of January, 1953, is a good example, as also is Professor John Cohen's paper "Study of Committees and Conferences" published in *Occupational Psychology*, April, 1952, Vol. XXVI, No. 2, and in the *Journal* of the Institute of Public Administration, Winter, 1952.

We should not be overawed or disheartened by the complexity of the human relations in and of large organizations any more than by the technical complexity of the material apparatus which accompanies them. Both sets of complexities are there to be handled and mastered. How can the Secretary of the Royal Society suggest that either of them will not yield to reason, or is a greater menace than the other?

Leeds. W. H. DUNKLEY,
Yorkshire Division,
British Electricity Authority.

Machine Tool "Productivity" Report

IN connection with the report of the productivity team on metalworking machine tools, the team would be obliged if you would lend the services of your journal to the correction of a technical error which appears in the report on page 39, in the section dealing with (American) Joint Industry Conference standards, subheaded "Electrical Standards."

At paragraph 2f, there appears a phrase "exclusion of direct-on-line starter of thermal overload protection type." Inquiries in the United States have now shown that such starters are not in fact excluded, the misunderstanding having arisen through the different usages of the word "magnetic" in the United States and the United Kingdom when applied to automatic contactor starters.

The matter could be effectively put right without the need for extended explanation by a short notice to the effect that "inclusion" should be substituted for "exclusion" in the phrase referred to.

Leicester. J. HOULDSWORTH,
Team Member.

(Technical Director, A. A. Jones & Shipman, Ltd.)

Street Lighting Improvements

IN October last BLACKPOOL Highways Committee submitted to the Minister of Transport a scheme, estimated to cost £49,200, for the improvement of street lighting in certain streets. The Minister has only agreed to a part of the scheme being carried out at the present time, at an estimated cost of £12,000, and the Committee has authorized this work to be put in hand.

HYDE Highways Committee reports that the Minister of Transport is now prepared to approve, for grant purposes, a scheme for improved lighting along Manchester Road and Mottram Road. The borough surveyor has been authorized to obtain tenders for the work.

EASTBOURNE Corporation has recently improved the lighting of Gildredge Road and Compton Street by installing on 25ft columns lanterns enclosing 400 W mercury lamps, blended with tungsten lamps, in place of the former low-mounted tungsten lamps.

SUTTON AND CHEAM Town Council is recommended to approve a scheme, estimated to cost £8,000, for the improvement of the street lighting in Central Road, Cheam Common Road, Malden Road, the Broadway, and Station Way.

Midlands Board Reorganization

Reduction in Number of Districts

THE South Staffs. & North Worcs. Sub-Area of the Midlands Electricity Board has been reorganized with the headquarters at Toll End Road, Tipton, Staffs, the sub-area manager being Mr. T. G. Keeler. The reorganization concerns the number of districts, and has resulted in a reduction from eleven districts to seven districts. The seven new districts are as follows:—

Brierley Hill District: Manager, Mr. A. S. Woodroffe, Associate I.E.E., district engineer, Mr. A. J. L. Savage, and district commercial engineer, Mr. A. D. Palmer. District office, 18, Dudley Road, Brierley Hill (telephone: Brierley Hill 7781).

Dudley District: Manager, Mr. R. A. Jones, Associate I.E.E., district engineer, Mr. C. Billingham, A.M.I.E.E., and district commercial engineer, Mr. G. E. Kemp, Associate I.E.E. District office, 265/266, Castle Street, Dudley (telephone: Dudley 4581).

Oldbury District: Manager, Mr. F. G. Haddon, district engineer, Mr. P. F. A. Taylor, and district commercial engineer, Mr. S. H. Wadley. District office, 15, Birmingham Street, Oldbury (telephone: Broadwell 1477 and Broadwell 2349).

Smethwick District: Manager, Mr. G. S. Fisher, district engineer, Mr. H. Hawkins, and district commercial engineer, Mr. D. F. Starr. District office, 373, High Street, Smethwick (telephone: Smethwick 1227).

Stourbridge District: Manager, Mr. J. E. Kenyon, A.M.I.E.E., district engineer, Mr. G. B. Patrick, A.M.I.E.E., and district commercial engineer, Mr. S. A. Wait. District office, 31, High Street, Stourbridge (telephone: Stourbridge 58126).

Wednesbury District: Manager, Mr. S. Raybould, A.M.I.E.E., district engineer, Mr. G. S. Smith, B.Sc., A.M.I.E.E., and district commercial engineer, Mr. R. B. Thomson. District office, Camp Street, Wednesbury (telephone: Wednesbury 0981).

West Bromwich District: Manager, Mr. T. G. Clarke, B.Sc., A.M.I.E.E., district engineer, Mr. J. R. Kimbley, A.M.I.E.E., and district commercial engineer, Mr. G. W. Price, A.M.I.E.E. District office, 296 298, High Street, West Bromwich (telephone: West Bromwich 1341).

East Midlands Area

Proposed Adoption of "Two-Tier" Structure

IN the *East Midlands Electricity Board Journal* (Spring Number) the chairman (Mr. C. R. King) deals with alterations in the structure of the Board's system, involving the establishment of a "two-tier" arrangement. This is regarded as ensuring the shortest possible route between the Board and those in direct contact with the consumers.

By the reorganization which was completed two years ago (*Electrical Review*, 2nd March, 1951, p. 447) the whole of the East Midlands Area, with the exception of the city Sub-Areas of Coventry, Leicester and Nottingham, was divided into managed Districts and it is now intended to further simplify the administrative machine. Mr. King says that the future Districts which he visualizes will be equal in importance and status to some of the present Sub-Areas. They will, of course, vary in physical size by reason of population and industry, mains networks and other factors. It is not proposed to set a time limit to this process; the transition will be gradual and may not be completed for five, seven or even ten years. The first steps are now being taken. Mr. Ian Macdonald, manager of the Leamington and Warwick District, has been transferred to the Ilkeston District which had previously been managed by the Sub-Area staff. The six managers at Chesterfield, Ilkeston, Mansfield, Matlock, Newark and Worksop will be responsible to Area headquarters and the former Sub-Area organization will be merged into the Districts. The Leamington and Warwick District, which has hitherto been attached to the Leicestershire and Warwickshire Sub-Area, will become part of the Coventry Sub-Area.

Stress is laid on the strengthening of relationships with the consumers and on the engineering aspects of the change. The staff are assured that they need not fear redundancy, in view of the continuing development of the Board's business, although for some of them changes of residence may be necessary. No proposals will be made without most careful consideration of the personal problems involved.

Domestic Appliance Design

Review of Recent Improvements

IN a paper presented before the Association of Supervising Electrical Engineers on 21st April Mr. J. I. Bernard reviewed trends in the design of domestic electrical apparatus. He showed that the kWh consumption per domestic consumer had increased from 520 in 1927 to 650 in 1939 and to 1,340 in 1951. Cookers, of which 2·5 million were in service, were the chief items in the all-electric home; they could be precisely controlled by "Simmerstats" to the lowest running heat. An essential need of water heaters, which came second (2·3 million), was correct installation, including adequate lagging.

Of the smaller appliances, fires (12 million), irons (11·5 million) and vacuum cleaners (6 million) were most widely used, followed by washing machines, wash boilers and refrigerators (1·4, 1·25 and 1·25 million, respectively).

Cookers and Water Heaters

Many improvements had been made in the design of cookers, particularly the use of oven thermostats and by the cabinet style of construction, often with utensil drawer. Pressed steel and better vitreous enamel (acid-resisting for the hob) enhanced appearance and facilitated cleaning.

First among the water heaters considered was the dual-element, self-contained type; this had a small top element heating 6 gall and a larger bottom switch-controlled element usually heating 20 to 30 gall. There was great scope for a self-contained 1½ to 3 gall non-pressure type for use with inefficient hot-water systems. The immersion heater, though probably cheapest in first cost, was dearest in running cost owing to its often being installed without heat insulation of the storage tank.

Reflector fires had gained ascendancy over the firebar type and wide-angle designs now gave uniform heat distribution, but progress had been hampered by a virtual ban on manufacture. Models made by some firms without previous experience brought fire hazards, but recent regulations required guarding that complied with B.S. 1945 : 1953; further protection, however, was needed (B.S. 1670 : 1951) for rooms occupied by children or by aged or infirm people.

For irons automatic control was usual. In some recent designs mica had been forsaken, the element often being a magnesia-insulated tubular sheath cast into a light alloy soleplate. By increasing the wattage to about 1,000, the weight had been reduced to 2 or 3 lb. A similar type of element had been adopted for kettles with a 1,500 W loading for the 3-pint size instead of 2,000 W as formerly used in some models. Thermostats on the slow-make slow-break principle for a.c. circuits had simplified design and reduced wear of contacts.

Most of the million washing machines installed since 1947 were small, with hand wringers, but sales of those with motor-driven wringers and rotary ironing attachments with heating elements were on the increase. Hermetically sealed compressor units for refrigerators represented probably the greatest engineering advance in domestic appliances; they would run for many years without attention. Smaller and cheaper absorption models were now available.

Motor Developments

Chief developments in universal motors used for vacuum cleaners and similar appliances were the substitution of moulded plastic-insulated commutators for the mica-insulated built-up type and the use of phenolic based enamel insulated wires capable of withstanding higher temperatures. Improved shaded-pole induction motors tended to supersede universal machines for fans, hair dryers and probably sewing machines. Reduction of radio interference and greater safety was secured by double insulation, the second layer of which was interposed between the motor frame and the exposed metal parts of the appliance.

The lecturer described the work of the E.D.A./B.S.I. Advisory Committee on Electrical Appliances and Accessories in promoting safety and outlined main points in connection with installation, especially with regard to water heaters. He finally discussed some maintenance problems.

As Americans See Us

Report on Electricity Supply by a United States Team

LAST year, at the invitation of the British Electricity Authority, a team of seventeen representatives of the United States electric utility industry visited Great Britain under the auspices of the Anglo-American Council on Productivity to make a field study of the B.E.A. system. The team's report* was published last Monday by the British Productivity Council (successor to the Anglo-American Council on Productivity: U.K. Section).

The team made a very close study of the British system, and this is supported by detailed statistics. Obviously it could not in the time available do more than indicate in its recommendations those points which in its view are deserving of detailed study by the B.E.A.

Team's Tribute

The team recognizes that only four years have elapsed since the integration programme was started and that during this period much has been accomplished. It pays a tribute to the principals, the engineers and other employees of the Central Authority, the Divisions and the Area Boards, who are regarded as "people of exceptional ability and enthusiasm." British plants visited were exceptionally well kept and showed evidence of "good housekeeping." The control rooms were well designed and had ample instruments to give the control engineer knowledge of all load conditions. The number of electrical operations compared favourably with common practice in the United States. Building materials and interior trim in newer plants are mostly of the highest grade and of fine appearance. Emergency repairs are done in an excellent manner.

The team visited six hydro-electric installations in Scotland and Wales, and was interested in the extensiveness of the projects. It is considered that these plants are of good design, and the equipment is of good quality. Remote control and semi-automatic features are being used wherever possible to reduce operating labour. Similar practices are being used in the United States more or less generally, and the tendency is to increase this practice extensively.

The report says that, in general, the new B.E.A. plants planned for 1956 are scheduled for 1·0 man per megawatt, which is not far from American practice. Data for exact comparisons of the overall economy of all plants in the two countries are limited, but a report for all British plants (1951) indicates a thermal efficiency of 21·61 per cent, against 25·32 per cent for 258 American plants (1950). Reference is made to the J. F. Field turbine cycle, which aims at a thermal plant efficiency of 38–40 per cent.

Reviewing in the main the post-war installations in this country, the report points out that these were designed at a time prior to to-day's demand for unexpectedly large quantities of electric power and before the need became apparent for utmost economy in materials and cost. Because of the longer time required to obtain essential approvals and construct plant in Great Britain—six or seven years in all compared with two or three in America—there is a sharp contrast in appearance, size and cost between these British plants and those being commissioned in the United States this year. Plans for future British plants call for simpler construction and lower costs, as has been the American trend, but British moves in this direction, for various reasons, do not appear to have gone so far as in many American plants.

Size of Sets

In a chapter on generation a number of comparisons are made of the design and construction of American and British plant. Whereas, it is said, in the United States many 125 to 175 MW units are going into service and 100 MW is a typical middle-range size, "most new 1952 British units

* Copies of the report (58 pp., price 3s post free, excluding air mail) are obtainable from the British Productivity Council, 21, Tothill Street, London, S.W.1, and from the British Electricity Authority, Trafalgar Buildings, 1, Charing Cross, London, S.W.1.

are 30–50 MW and only a few 100 MW turbines are planned for 1956–7 plants." In the U.S.A. 250 MW tandem compound reheat units are being offered for installation in 1955. American experience has shown that there is a 25 per cent saving in material and construction cost by doubling unit capacity and 40 per cent when the size is tripled.

British power plant design is based on coal of 9,000 B.Th.U./lb whereas 11,000 B.Th.U./lb coal could be readily assured by modern coal preparation plants at the mines. Low coal quality has limited the dependable size of boilers.

Steam Conditions

Steam pressures and temperatures are lower in British practice than in American. Typical units now going into service in America call for 1,500 lb/sq in and 1,050 deg F plus reheat, and higher steam conditions are being planned for the time when alloy metals are freed from control.

The new steam plants being commissioned in Britain give an impression of large building bulk for the capacity contained. This bulk stems, first of all, from the smaller rating of turbines, and from the frequent use of spare boilers or two boilers per turbine (as against one boiler in accepted American practice). Until recently, also, British turbines of equal capacity have been greater in overall length than American units. British practice tends to single-shaft turbo-generators. Trouble has developed on several of the high-pressure turbine spindles in Britain, requiring them to be sent back to the manufacturer for repairs, including heat-treatment of shafts. No single fault appears to be the cause; length in itself could be a responsible factor. Foundation design would be simplified, plant building volume reduced and critical materials saved by more compact designs. The use of higher steam pressures and temperatures for all future generating plants is advocated.

There grew up a highly effective technique in Great Britain for cooling tower design when water was scarce. American designers in areas of water shortage might well review the details of these designs; their technique of erection appears to have been excellently developed for rapid and low-cost construction. Despite good cooling tower design, there is a distinct impression that the integrated British system could well abandon the inland river situations in favour of the estuaries and sea coast.

The report contains a comprehensive study of the "electrical system," and with this is printed a map of England, Wales and South-East Scotland showing in detail elements of the proposed 275 kV grid.

British practice is said to be to keep equipment loading—and lines and cables as well—at a much lower level than is regularly the practice in America. It is believed that installation of lightning arrestors at the terminals of all large power transformers would add much to the transformer reliability.

Although the ratio of cost of underground to overhead distribution construction in Britain is remarkably low, it is believed that a much greater use of overhead distribution is essential to the conservation of critical materials and to the making of capital available for serving a greater number of customers.

There is great need for working in closer co-operation with other utilities for a better understanding of mutual problems. In this category are joint occupancy of pole lines at higher voltages with railroad and communication utilities, revision of regulations affecting overhead line construction, formulation of mutually acceptable rules regarding the earthing of circuits and their prompt disconnection in case of failure, and many other factors which affect investment and operating costs.

Labour Relations

A chapter on "Personnel and Labour Relations" contains a series of comments and recommendations on various aspects of the manning problem. Approval is expressed of a recent wage adjustment negotiated at national level, which gave increased recognition to the value of skills in the higher wage "brackets." This agreement seemed to mark a desirable trend in the interest of greater productivity. The labour relations machinery appears to be working satisfactorily and the calibre of representation on both the management and union sides seems to be good.

Consideration might be given to the use of aptitude tests as a part of the employment and promotion procedure. The use of pre-employment physical examination might well be given consideration. It is suggested that the educational standards for lower-level supervisory and technical jobs be

reviewed. It is understood that the equivalent of a university technical education is now considered desirable for such jobs as control engineer, turbine engineer and combustion engineer. More of these jobs might be capably filled by men with good practical experience on jobs next below, and with requisite qualities. The team found the personnel training programmes for the most part commendable.

While accident statistics are not entirely comparable, there is good reason to believe that the B.E.A.'s accident rate is somewhat higher than the American average. The difference may lie in the much more complete programmes of safety education which are common among American power companies, and also in the increased emphasis placed on training individuals to be alert to hazards.

In a chapter headed " Commercial " it is recommended that the B.E.A. (this, of course, means Area Boards) should leave wiring contracts to the private contractors who are said to be reliable and capable of doing this work.

The report concludes with a chapter on " Purchasing." It is suggested that the duplicate purchasing organizations and duplicate storerooms, as between the Divisions and the Area Boards, may be justified, inasmuch as the Divisions are concerned primarily with coal purchases and with power plant and transmission line supplies, whereas the Area Boards are concerned with a broader range of smaller items. It is quite possible, however, that there is some duplication which could be eliminated, and the possibility of consolidating all purchases and storerooms under a joint purchasing officer reporting to the Divisional Controllers and the Area Board chairmen should be considered.

SUMMARY OF PRINCIPAL RECOMMENDATIONS

1. Liberalize the concept of equipment loadings, with due regard to emergency ratings, to realize greater use of present equipment.
2. Change the boiler inspection law, thereby increasing boiler availability by approximately 3 per cent.
3. Speed up the procedures for obtaining approvals on new sites for steam power plants.
4. Specify larger turbo-generators of the order of 150 to 200 MW, matching these with single boilers.
5. Lengthen the period between turbo-generator overhauls from three years to four or five years.
6. Utilize the unused inherent capability of present lines and equipment by the installation, at suitable points, of power-factor corrective and control equipment.
7. Simplify substation designs so as to require smaller investments.
8. Install customer meters on the outside of new buildings.
9. Allocate more funds for the development and promotion of rural electrification.
10. Provide for a greater differential in wage-scales between lower and higher skilled workers, to give increased recognition to the value of skills.
11. Educate members of trade unions on the need for increased productivity to raise the workers' standard of living.
12. Utilize technical personnel, both non-university and university graduates, more efficiently.
13. Consolidate, in each area, duplicating purchasing functions of Divisions and Area Boards.
14. Provide closer timing on deliveries of equipment and materials to construction jobs.

European Power

THE first of an annual series of analyses of electricity consumption, production, international trading and prices has been published by the United Nations Economic Commission for Europe. Entitled " Recent Developments in the Electric Power Situation in Europe, 1951-52," the present document of 140 pages, which include 32 tables, is obtainable from the Sales Section, United Nations, Geneva, at 4s 6d (2·5 Swiss francs).

Particulars are given of growth of electricity production (now 38 per cent hydro) at costs reduced by 30 to 60 per cent since 1938 in different countries. In 1951 thermal production increased by 10 per cent over the previous year, but coal by only 7 per cent, saving 4·5 million tons. Unharnessed hydro resources are expected to allow a rapid increase for ten to fifteen years, but in Italy thermal power stations will gradually become more important. Guaranteed international exchanges of electric power were 1·6 per cent of the aggregate production of 340,000 million kWh in 1951.

Transmission lines in France, Western Germany and Switzerland now operated at 220 kV have been constructed for eventual operation at 380 kV. Increases in thermal capacity by 21,000 MW (4,300 MW in 1951) and of hydro capacity by 14,000 MW (2,400 in 1951) are projected for commissioning between 1952 and 1955 to meet a growth of demand of 9 per cent per annum. This would give 0·10 kW per inhabitant for Europe compared with 0·28 kW for the U.S.A.

ELECTRICITY SUPPLY

Collier for Coronation Naval Review

Abolition of Prompt Payment Discounts

THE s.s. *Sir Archibald Page*, a 4,600 ton collier of the British Electricity Authority, will be one of the twelve coastwise ships taking part in the Coronation Naval Review at Spithead on 15th June. Built in 1950, the collier is one of the largest of the Authority's fleet of forty-seven, and is equipped with the most modern navigational aids. She has a cargo capacity of 4,380 tons and transports about 200,000 tons of coal a year to power stations in the lower reaches of the Thames.

Meter Certification

The South West Scotland Electricity Board has completed the work of certifying all a.c. domestic consumers' meters in terms of the Electricity Supply (Meters) Act, 1936. At vesting date there were over 300,000 uncertified meters on circuit and, including new consumers, the certification programme has involved the certification of more than 500,000 meters since that time. The Board is proceeding with re-certification on a 20-years programme at the rate of approximately 40,000 meters per annum.

Representation on Consultative Councils

Durham County Parish Councils' Association is pressing for parish councils to be represented on the gas and electricity consultative councils. The National Association of Parish Councils has already discussed this matter with the Ministry of Fuel and Power without success. The Durham Association has asked the National Association to try to have the matter raised in Parliament.

Council House Installations

Newcastle-on-Tyne City Council has received sanction to proceed with the third stage of its scheme for installing electricity in houses at present supplied only with gas. The houses concerned are in the Cowgate and Barrack Road areas. The work may begin early next year, and meanwhile the Electricity Board is to lay the necessary cables.

Ulster Rating Appeal

An appeal by the Electricity Board for Northern Ireland against the inclusion in the valuation lists of a pole-mounted transformer at Dooragh was heard recently at Dungannon Quarter Sessions. For the Board, Mr. H. A. M'Veigh, Q.C., said that it was an important case because there were a large number of such installations all over the country. Details of the distribution system were given by Mr. T. G. Christie, the Board's chief engineer.

Judge Johnson, in a reserved judgment, said that the main transmission lines were exempt under the Electricity Supply Act of 1931 and the question was whether the transformer was part of the main transmission line. At Dooragh by means of the transformer the 33 kV main was tapped off to supply consumers and the voltage was reduced to 230 V. The transformer was something that was not necessarily working for the control of the transmission line and having regard to all the evidence he considered that the transformer was not exempt from the section and that it had been properly valued. The appeal was dismissed with costs.

North Eastern Tariff Revision

At a meeting of the North Eastern Electricity Consultative Council at Newcastle-on-Tyne it was announced that the 2½ per cent discount for the prompt payment of electricity accounts would end on 1st July. It was also announced that electricity charges for heating, cooking and power for commercial and small industrial consumers would be increased from 1¼d to 1½d/kWh, with a similar rise in shop tariffs. These increases are expected to increase revenue by £368,000 annually. Mr. H. H. Mullens, chairman of the Electricity Board, stated that last year the Board's accounts showed a deficit of £162,000 and provision had also to be made for £194,000 for taxation and liabilities. Matters had been made worse by the recent 10 per cent increase in coal charges. The North Eastern Board had been one of the very few Area Boards to retain some form of discount. An adjustment in prepayment meter charges is also to be made.

B.E.A. Boiler Plant

In the list of new boilers installed in B.E.A. power stations in March (*Electrical Review*, 24th April, p. 967) the details of the Clarke Chapman unit were given incorrectly. It is a 320,000 lb/hr boiler installed at Brunswick Wharf power station.

RECENT INTRODUCTIONS

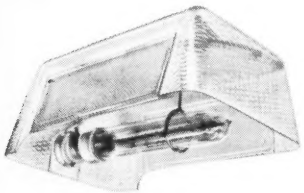
Notes on New Electrical and Allied Products

Unusual Battery Charger

THE latest battery charger to be made by the EDISON SWAN ELECTRIC CO., LTD., 155, Charing Cross Road, W.C.2, is unusual in that it has been made mobile. This has been done so that it can readily be moved on a railway station platform and train batteries can be charged *in situ*. Suitable a.c. sockets are available along the platform so that long cables are avoided and recharging is carried out without loss of time and with the minimum of inconvenience. Three output circuits are provided giving 20 A, 10 A, and 10 A respectively at 24 V.

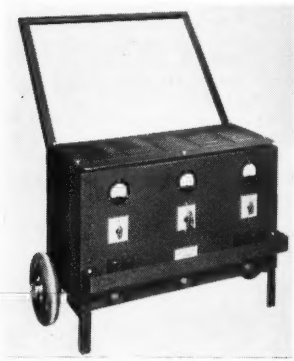
Side Street Sodium Lantern

The latest lantern for side road lighting to be introduced by the GENERAL ELECTRIC CO., LTD., Magnet House, Kingsway, London, W.C.2, is arranged for top entry mounting at a height of 13ft to 15ft with a spacing of 100ft to 120ft apart in roads up to 30ft wide; it houses a 45 W or 60 W sodium lamp. Essentially the lantern is a one-piece open inverted "Perspex" bowl, with refractor plates of the same material bonded to the sides. On the inside of the lantern a cast aluminium spider carries the tapped mounting boss, lamp steady and porcelain terminal block. The porcelain bayonet cap lampholder is mounted directly on the inner surface of one end of the bowl and is connected by heat-resistant insulated cable to the terminal block. An earthing screw and porcelain cable cleat are provided.



G.E.C. side street lantern

"Ediswan" mobile battery charger



De-luxe Cooker

An exceptionally large oven, grill and hot-cupboard, together with automatic timing and easy cleaning facilities, are special features of the new "Falco Royal" cooker made by FALCO ELECTRICAL APPLIANCES, LTD., Corporation Road, Audenshaw, Manchester. Measuring overall 49in high (36in to hotplate), 23in wide by 23½in deep, the cooker has an oven 16½in by 17½in by 15½in.

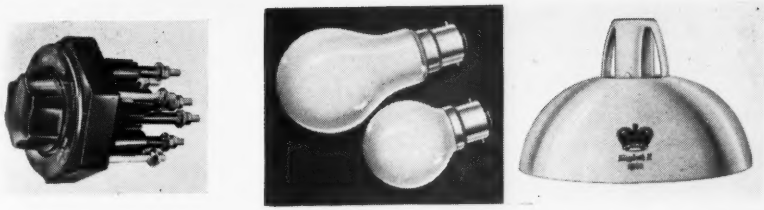
The radiant hotplates (two 8in and one 6½in) are arranged to give maximum pan space and all three are fitted with "Simmerstat" control. The grill, which has three-heat control, is separate, the whole grill compartment coming out in one piece for cleaning. The grill pan takes four slices of bread and can also be used in the oven as an extra meat tin.

All the controls are neatly grouped on the back panel, in the centre of which is a tubular lamp illuminating the hob. White vitreous enamel is used for the finish both of the exterior of the cooker and the oven. The latter, which is removable in sections for cleaning, is fitted with dull chromium grids which can be drawn forward without tipping. The price is £85.

Rotary Instrument Switches

Rotary switches, suitable for connecting in the secondary circuits of current and potential transformers to enable one instrument to be changed from one circuit or phase to another have just been put on the market by J. G. STATTER & CO., LTD., 82, Victoria Street, London, S.W.1. Current transformer secondary circuits cannot be open-circuited when operating the switch.

The switches are of simple construction and



Left: **Statter rotary instrument switch.** *Centre:* **"Atlas Junior" lamp compared with a standard 40 W lamp.** *Right:* **Benjamin "Nursery Coolicon" reflector**

comprise fixed and moving portions of moulded insulation material with metal inserts. The finish is bright black and the white engraved lettering gives a clear indication of the dial readings. Operation is positive and is obtained by a spring loaded ball engaging in dedents.

Standard switches are suitable for fixing to panels not more than 1in thick and Bakelite shrouds over the back connections afford ample protection when the switches are mounted on steel panels. For use where panels are more than an inch thick extended terminal stems are available.

Smaller Lamps

A 40 W gas-filled pearl "Atlas" lamp, much smaller than standard size, is now being made by THORN ELECTRICAL INDUSTRIES, LTD., 105-109, Judd Street, London, W.C.1. Designed especially for use in small table light fittings such as the "Geni" and Geo. Forrest's "Modern," this "Junior" lamp has a 50 mm bulb and standard bayonet cap. Its retail price is 1s 8d plus 3½d purchase tax in the United Kingdom.

Lighting Reflectors

Two new additions have been made to the "Coolicon" range of lighting reflectors made by BENJAMIN ELECTRIC, LTD., Brantwood Road, London, N.17. With its gaily coloured figures the "Nursery Coolicon" is particularly appealing to children, though parents will appreciate its design and the fact that it is practically unbreakable. It is supplied with either white, black, green or blue galleries, which snap together easily and securely, employing no screws. The figures are protected by glossing the shades all over, this enabling it to withstand repeated washing. Made in a 9in size for lamps up to 60 W, the reflector costs 8s (plus 1s 6d purchase tax in the United Kingdom).

Similar in general design, the new "Coronation Coolicon" is made in 11in size for lamps up to 100 W. The price is 6s 8d (plus 1s 3d P.T.). Another reflector specially designed for Coronation or other festive lighting is the "Treelite." Particularly suitable for tree or bush lighting it provides all-round illumination, upward lighting apertures giving a pleasing effect in the foliage. It is 12in in diameter and cellulose spray finished, green outside and white inside. It takes lamps up to 150 W. The list price is 7s 6d.

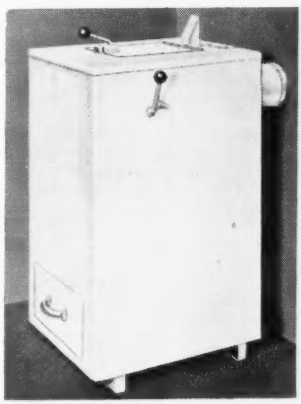
Central Sanitary Incinerator

Another sanitary incinerator is being made by the GENERAL ELECTRIC CO., LTD., Magnet House, London, W.C.2, for use centrally in buildings having oil fired boilers or other heating systems that preclude burning of refuse.

The external dimensions are 18in by 20in by 30in high. The rating is 6 kW and the incinerator is arranged for direct connection with the mains. A heat resisting lining and thermal insulation are provided, and the double charging lid at the top of the unit measures 8in by 10in and has an internal spring seal.

The temperature is controlled by a process timer which allows settings of up to one hour, this period having been found adequate for all purposes of drying and ignition. A hand operated rocker hearth is fitted and there is a withdrawable ash drawer at the bottom. A 6in flue outlet is provided at the back of the unit.

G.E.C. central sanitary incinerator



Financial Section

STOCKS and SHARES

GILT-EDGED stocks have gone well into the lead during the past few weeks, with the industrial sections of the Stock Exchange showing little disposition to recapture their first enthusiasm over the Budget's tax concessions. Prices remain reasonably firm but are now well behind the levels reached a month or so ago. This is taken to mean that the uncertainties raised since then by international developments are competing with domestic affairs as the main preoccupation of investors.

Johnson and Phillips Issue

Dealings in the new shares offered last week to existing holders of Johnson & Phillips ordinary stock began at a premium of 21s 3d on the issue price of 30s. Stockholders have the right to take up one new share on these terms (which are so advantageous as to make underwriting superfluous) for every four in hand. In declaring a final dividend which again makes a total of 15 per cent for the year, the directors give it as their opinion that future profits should justify the maintenance of this rate on the capital so increased. (The same rate has been paid since 1940.) On this assumption, the new shares at an all-in price of 51s 3d (free of transfer stamp for the present) offer a yield of 5⅞ per cent on the money.

Ever Ready Dividend

Ever Ready (Great Britain) 5s shares kept steady at 28s 6d after the company's declaration of a final dividend which brings up the total to 35 per cent for the fourth consecutive year. It involves the distribution of a little over £200,000 net from the surplus of £348,000. The latter is below last year's figure, but only because of a £30,000 rise in the taxation charge, which includes an amount, not yet stated, on account of excess profits levy. There is a yield of 6·1 per cent at the present price of the shares, which had previously attracted attention in connection with the Budget reductions in purchase tax.

Lancashire Dynamo

Preliminary figures published by Lancashire Dynamo Holdings were on much the same lines as those referred to above in the case of Ever Ready, a moderate expansion in the group trading profit having apparently been rather more than offset by heavier taxation. On a measure of disappointment with the decision to retain the dividend at the previous rate of 12½ per cent, the £1 shares turned to the dull side, but the official quotation remains at 46s 3d. The shares show a yield of about 5½ per cent, which gives credit to the substantial margin existing between the cost of the dividend and the distributable earnings, as well as to the consistently good record.

Vickers and I.C.I.

Results announced recently by two of the giants of the industrial market make a contrast illustrating the irregularity which developed last year as between one group of industries and another. Vickers, with their widespread engineering interests, are able to raise the dividend for the year from 12½ to 15 per cent on the strength of an almost 40 per cent advance in the net group profit. Imperial Chemical Industries are maintaining the distribution for the year at 13 per cent, but from earnings reduced by some 26 per cent (before tax), despite a record turnover. The price of Vickers shares came back to 47s 6d ex-dividend, after being over 50s, and I.C.I. were called 44s 3d cum-dividend following the news. The yield is a little over and a little under 6 per cent respectively.

Company News

Sturtevant Engineering 5s shares hardened to 25s 9d after the increase in the final dividend. Allowing for a small capital bonus, this makes a total equivalent to approximately 18·1 per cent tax-free for the year, or 1½ per cent more than before, and so carries on a particularly satisfactory series of previous improvements. The net yield of 3½ per cent on the shares is equivalent to 6¾ per cent less tax. Dictograph Telephone 2s shares, now 6s 6d, stand near the best quotations recorded, at any rate since the war, on the strength of the proposed 20 per cent share bonus and the company's intention subsequently to maintain the 10 per cent interim dividend on both the new and old shares.

Price Changes

The rise in Government securities halted at the unexpectedly early appearance of the new issue of £125 million 4¼ per cent British Electricity stock 1974/79. Dealings are taking place at a small discount on the issue price of 100. In the market for electrical engineering

shares, a main feature was the recovery of 5s in C. A. Parsons shares to 67s 6d, satisfaction with the annual accounts having replaced some earlier disappointment over the conservative dividend decision. English Electrics have lost about half the Budget-week rise, a movement fairly typical of the trend among leading industrials. B.I.C.C. and Mather & Platt, however, advanced again on further consideration of the dividends and results announced last month. Murex at 60s are another strong point.

Company	Dividend Previous	Dividend Last	Middle Price 27th April 1953	Week's Rise or Fall	Est. Yield p.c. £	s	d
Gilt-edged and Overseas Stocks							
Brit. Elec. 1968/73	3	3	88	+½	3	8	2
Brit. Elec. 1974/77	3	3	86½	—	3	9	4
Brit. Elec. 1976/79	3½	3½	92	—	3	16	1
Brit. Elec. 1974/79	4½	4½	100½	−½	4	4	6
Calcutta Elec. ..	6†	6†	20 6	—	5	17	0†
East African Power	7	7	23 -	—	6	1	8
Nigerian Elec. ..	10	10	22 6	—	8	18	0
Palestine Elec. "A"	5†	Nil	13 6	—	—		
Perak Hydro-Elec.	Nil	Nil	15 -	—	Nil		
Equipment and Manufacturing							
AberdareCables(5/-)	20	25	15 -	−1 -	8	6	8
Aerialite (1/-) ..	83½	88½	9 6	—	9	6	0
Allen, W. H. ..	15	15	46 3	—	—		
Aron Elec. Ord. ..	15	15	38 9	—	7	14	10
Assoc. Elec. Ord. ..	20	20	80 -	—	5	0	0
Automatic Tel. & El.	15	15	63 -	−1 -	4	15	3
Babcock & Wilcox	18	18	72 6	—	4	19	3
Baldwin, H. J.(2/-)	25	20	4/-	—	10	0	0
Bakelite(10/-) ..	—	12½	17 -	−6d	7	7	0
British Aluminium	12	12	39 6	−6d	6	1	6
B.I. Callender's ..	9	10	37 6	+6d	5	6	8
British Thermostat (5/-)	30	30	33 9	—	4	9	0
British Vac. Cleaner (5/-)	25	25	14/-	—	8	18	8
Brook Motors (10/-)	20	20	33 9xd	—	5	18	6
Brush Ord. (5/-) ..	10	4	4 3	—	—		
A. F. Bulgin (1/-) ..	30	30	2 9	−3d	10	18	0
Burco (5/-) ..	38½	35	18 9	—	9	6	8
Chloride El. Storage	15	20	70/-xd	—	5	14	4
Cole, E. K. (5/-) ..	25	25*	17 6	—	—		
Cossor, A. C. (5/-) ..	Nil	10	10 -	−6d	5	0	0
Crabtree (10/-) ..	17½	17½	31 3	—	5	12	0
Crompton Parkinson Ord. (5/-) ..	11½	11½	9 9	—	5	15	5
De La Rue (5/-) ..	50	35*	8 -	−6d	—		
Decca (5/-) ..	112½	150	26/-xd	−⅛	5	15	6*
Dewhurst (2/-) ..	22½	19*	5 3	—	7	4	9
Dictograph Tel. (2/-)	20	20	6 6	—	6	3	0
E.M.I. (10/-) ..	12	12	13 3	−⅛	9	1	3
Electrical Components (5/-) ..	20	20	10/-	—	10	0	0
Elec. Construction	15	15	55 -	—	5	9	0
Enfield Cable Ord.	7½	5	22 -	—	4	11	0
English Electric ..	15	15	58 -	−1/-	5	3	6
Ericsson Tel. (5/-)	22†	22*†	39 6	—	2	15	9†
Ever Ready (5/-) ..	35	35	28 6	—	6	2	9
Falk Stadelmann ..	15	15	43 3	+6d	6	18	9
G.E.C. Ord. ..	22½	22½	42 6	—	5	6	0*
General Cables (5/-)	30	30	16 3	—	9	4	6
Greenwood & Batley	15	15	40/-	—	7	10	0
Hackbridge Cable (5/-)	20	20	12/-	—	8	6	8
Hackbridge Hewittic (5/-)	18	20	16/3	—	6	3	0
Hall Tel. Acc. (10/-)	10	10	11/9	−9d	8	10	2
Henrae (2/-) ..	12½	12½	4/-	—	6	5*	0
Hedleys (10/-) ..	20	20	18 6	—	5	8	1*
Hellophane (5/-) ..	15	20*	12 6	—	8	0	0
Hoover (5/-) ..	35	25	23/-	—	5	8	0
Equipment and Manufacturing (continued)							
Intl. Combustion (5/-)	25	15*	14/-	—	5	7	2
Johnson & Phillips	15	15	51/-xr	—	5	17	9
Lancashire Dynamo	12½	12½*	46/3	—	5	8	0
Laurence, Scott (5/-)	12½	15	14/3	—	5	5	3
London Elec. Wire	12½	12½	58/3	—	4	5	9
J. Lucas	7½	9½	41/3	—	4	9	0
Marryat & S. (2/-)	22½	22½	5/9	—	7	16	6
Mather & Platt ..	12½	15	49/6	+6d	6	1	3
Metal Industries ..	10	15	14/9	−⅛	—		
Mid. Elec. Mfg. ..	15	15	60/9	—	4	18	9
Murex	12½	15	60/-	+2/-	5	0	0
Newman Ind. (2/-)	10	10	2/4½	—	8	8	5
Oldham & Son (1/-)	30	35	2/6	—	—		
Parnall (Yate) (5/-)	6	6	3/4½	−3d	8	17	10
Parsons, C. A. ..	10*	12½	67 6	+5/-	3	14	0
Plessey (5/-) ..	22½	25	24 6	—	5	2	0
Pye Deferred (5/-)	18	18	19 6	—	4	12	4
Revo (10/-) ..	27½	27½	46/-	—	5	19	7
Reyrolle	10*	12½	57/6xd	+9d	4	7	0
Scot. Cable (4/-) ..	30	32	13/-	—	—		
Siemens Ord. ..	10	10	35/6	−6d	5	12	9
Southern Areas ..	Nil	5	12/9	—	7	16	10
Strand Elec. (5/-) ..	17½	17½	10 6	—	8	6	8
Sturtevant (5/-) ..	17¼†	18¾*†	25/9	+9d	3	10	0*†
Switchgear&Cowans (5/-)	22½	22½	16 3	—	6	18	6
Taylor T. (5/-) ..	20	25	20/-	—	6	5	0
T.C.C. (10/-) ..	20	20*	41 3xd	+9d	4	17	0
T.C. & M. ..	10	8½*	28/-	—	6	1	6
Telephone Mfg. (5/-)	10	10	8 9	−3d	5	14	3
Thorn. Elec. (5/-) ..	10	12½	10/-	—	6	5	0
Tube Investments	25	15*	60/-	—	5	0	0
Vactric (5/-) ..	Nil	Nil	5/-	—	Nil		
Veritys (5/-) ..	7½	10	5/-xd	+3d	10	0	0
Walsall Conduits (4/-)	70	70	46/6	—	—		
Ward & Goldstone (5/-)	45	45*	35/-	+9d	—		
Watford (2/-) ..	25	25	7/-	—	7	2	10
Westinghouse Brake	14	15	53 9	—	5	11	6
West, Allen (5/-) ..	15	15	12/3	—	6	2	6
Trusts, Transport and Communications							
Anglo-Am. Tel.: A Ord. ..	—	6	89½	—	6	14	0
Ord.	—	3¾	54½	—	6	17	6
Anglo-Portuguese	8	8	22 3	−1/-	7	3	10
Brit. Elec. Traction: Def. Ord. ..	22½	25	515	+10	4	17	1
Cable & Wireless: Ord.	8	8	133	—	6	0	4
4% Loan ..	4	4	95	—	4	4	3
Calcutta Trams ..	6†	6†	22/9	—	5	5	6†
Cape Elec. Trams..	5	5½	11 6	—	9	11	4
Marconi Marine ..	10	10	30 6	—	6	11	2
Oriental Tel. Ord.	16	16	72/-	+½	—		
Telephone Props...	8	8	90/-	−5/-	—		
Tele. Rentals (5/-)	10	10	9 9	−6d	5	2	7

* After capital bonus. † Dividends are paid free of Income Tax.

REPORTS and DIVIDENDS

Johnson & Phillips, Ltd., report a group trading profit for 1952 of £706,366, as compared with £803,796 for the preceding year, to which is added £21,974, income from trade investments, and £91, transfer fees, making £728,432. From this are deducted loan interest, £26,990, depreciation, £59,485, pensions, etc., £39,501, and taxation, £310,000, leaving a net profit of £285,656 (against £350,308). After adding a balance of £154,817 brought in, and allocating £155,000 to reserves, it is proposed to pay a final ordinary dividend of 7½ per cent, making 15 per cent for the year (unchanged). The balance carried forward is £154,314. The Scottish group (Aurora Lamps, Ltd., incorporating British National Electrics, Ltd.) shows a credit balance on profit and loss account of £65,093 and an excess value of assets of £81,398 which do not appear in the principal company's accounts.

The directors state that at least £500,000 of new permanent capital is required and can be profitably employed in the business and they have therefore decided to make an issue of 333,437 ordinary shares of £1 each and to offer them by way of rights to ordinary shareholders in the ratio of one new share for every four shares held, at the price of 30s a share. Shareholders may apply for additional shares which may be available should all the shareholders not take up their rights. Treasury consent has been obtained to the issue.

Hopkinsons, Ltd., reports a profit for the year to 31st January last of £837,887, as compared with £799,291 for the preceding year, and after providing £487,750 for taxation, there is a net balance of £350,137 (against £345,380). Reserve for contracts maintenance receives £11,000 and it is proposed to pay a final dividend of 22½ per cent, making 32½ per cent for the year (against 27½ per cent). The balance carried forward is £715,446 (against £450,859 brought in).

An extraordinary meeting will be held on 21st May to ratify an increase in the authorized capital from £700,000 to £1,050,000 and to capitalize £350,000 of reserves to make a free scrip issue of one-for-one to ordinary holders.

Veritys, Ltd., reports a trading profit for 1952 of £65,375, as compared with £35,812 for 1951, and after deducting depreciation, and £39,517 for taxation, there is a net balance of £16,465 (against £12,586). It is proposed to pay an ordinary dividend of 7½ per cent for the year (against 5 per cent), and to repeat the bonus of 2½ per cent. The balance carried forward is £27,493 (£20,928 brought in).

Lancashire Dynamo Holdings, Ltd., reports a group net profit for 1952, before taxation, of £488,302, as compared with £481,082 for 1951. Taxation absorbs £287,771, and it is proposed to pay a final dividend of 8½ per cent, maintaining the distribution for the year at 12½ per cent.

The Ever Ready Co. (Great Britain), Ltd., in a preliminary statement, reports a consolidated net profit, before taxation, of £847,625 for the year ended 28th February last, as compared with £834,150 for 1951-52, and after deducting £499,362 for taxation, there is a net balance of £348,263 (against £364,584). It is proposed to pay a final ordinary dividend of 20 per cent, again making 35 per cent for the year.

The Ever Ready Trust Co., Ltd., reports a revenue balance for the year ended 31st March last of £55,657, as compared with £52,217 for 1951-52, and after deducting £30,250 for taxation and placing £10,000 to revenue reserve, it is proposed to pay a final dividend of 9 per cent (against 8 per cent), making 14 per cent for the year (against 13 per cent). The balance carried forward is £10,482 (against £17,800 brought in).

Blaw Knox, Ltd., reports a trading profit for 1952 of £405,627, as compared with £401,708 for 1951, and after meeting all charges, including £164,094 for taxation, there is a net profit of £168,509 (against £121,028). General reserve receives £100,000 and the ordinary dividend for the year is unchanged at 30 per cent. The balance carried forward is £289,986 (against £260,108 brought in).

R. B. Pullin & Co., Ltd., propose to make an issue of £75,000 7½ per cent cumulative redeemable preference shares and £75,000 in 2s ordinary shares which will be offered to shareholders at 2s 6d each on the basis of three new shares for every four held. Application may also be made for additional shares. Electric and General Industrial Trust is guaranteeing the subscription of both classes. Treasury consent to the issue has been obtained.

Kerry's (Great Britain), Ltd., reports a group net profit for 1952 of £132,336, as compared with £234,790 for the previous year. Taxation requires £69,107, taxation equalization account receives £2,200, and staff pensions £7,000. The ordinary dividend for the year is unchanged at 15 per cent by a final payment of 10 per cent. The balance carried forward is £172,807 (against £149,059 brought in).

The Rheostatic Co., Ltd.—The annual meeting was held on 23rd April, when Mr. M. J. Gartside (chairman), who presided, said that the additional space available at the Frimley and Farnham works has been utilized to the full, and as a result turnover had increased by 18 per cent as compared with the previous year. Their position had been

well maintained in all markets and "Satchwell" controls had been applied to many new buildings both at home and overseas and to a wider range of industrial processes. The proportion of export to home sales had been maintained, and exports to Australia had now been resumed at a satisfactory level. There was a considerable advance in turnover of resistors for the heavy industry and electric traction. Subsidiary companies overseas had contributed profitably to the group figures. They were at present fully engaged in meeting demands and continued to achieve a high output.

Bakelite, Ltd.—Particulars were advertised on Monday last, and the subscription list opened and closed yesterday (Thursday), for an issue of £1,000,000 5 per cent debenture stock 1968-77 at par. The proceeds of the issue are to be used to pay off the bank loans of £750,000 already incurred in the construction of the company's new vinyl resin factory at Aycliffe, Co. Durham, and to cover the cost of completion of the project.

The Sturtevant Engineering Co., Ltd., reports a group profit for 1952 of £640,019, as compared with £578,558 for 1951, and after providing £338,775 for taxation, there is a net profit of £301,244 (against £248,583). General reserve receives £167,314 and contingencies reserve £50,000. It is proposed to pay a final dividend of 13½ per cent (against 12 per cent), making 18.09 per cent, tax free, for the year on increased capital (against 16½ per cent on smaller capital). The balance carried forward is £103,816 (against £91,268 brought in).

The West London & Provincial Electric & General Trust, Ltd., reports a net profit for 1952 of £26,222, as compared with £25,976 for the previous year. It is proposed to pay a final ordinary dividend of 5 per cent and a bonus of 2 per cent, making 10 per cent for the year (same).

Aerialite, Ltd., has declared an interim dividend of 33⅓ per cent (unchanged).

Brook Motors, Ltd., has declared an interim dividend of 5 per cent on the ordinary shares (unchanged).

The Calcutta Tramways Co., Ltd., is paying an interim dividend of 2½ per cent, tax free (unchanged).

New Companies

Richard-Edwards Engineering Co., Ltd.—Registered 2nd April. Capital £100. Electrical, radio, radar, television and optical engineers, etc. Directors: D. E. Urrey and W. R. Walls. Regd. office: 156, Acre Lane, Brixton, S.W.

Head Air Purification Co., Ltd.—Registered 7th April. Capital £3,000. To acquire a certain patent in the name of Reginald O. Read; to carry on the business of the manufacture, installation and research into air-conditioning, ozonizing, heating, refrigerating and ventilating systems and equipment by electrical, mechanical and chemical methods, etc. Regd. office: National House, 240/244, King Street, Hammersmith, W.6.

G.C.M. Electrical Supplies, Ltd.—Registered 8th April. Capital £3,000. Electrical, radio and television engineers, contract and service engineers, etc. Directors: G. C. Maskell, 3, Stoughton Road, Oadby, Leics, and W. B. Smith, 22, Allandale Road, Leicester.

Keighley Electrical Wholesalers, Ltd.—Registered 7th April. Capital £1,000. Regd. office: 53, Sun Street, Keighley.

Polylectric, Ltd.—Registered 8th April. Capital £1,000. Electrical, mechanical and general engineers, etc. Directors: Ll. W. Jones and G. Jones. Regd. office: 12a/13, Gloucester Mews West, Paddington, W.2.

Armstrong Recorder Co., Ltd.—Registered 2nd April. Capital £100. Manufacturers of and dealers in recording and repeating apparatus, wireless and television apparatus, etc. Directors: C. C. Jackson and L. V. Smith. Regd. office: 25, Oxford Street, W.1.

Eton Cables, Ltd.—Registered 1st April. Capital £1,000. To acquire the business of general engineers now carried on at rear of 101a, High Street, Eton, Berks, by the Canute Engineering Co., Ltd. Directors: L. W. Graham and J. Tuddenham. Regd. office: 6/7, Queen Street, E.C.4.

Harold W. Holt & Son, Ltd.—Registered 1st April. Capital £2,000. To acquire the business of an electrical engineer heretofore carried on by H. W. Holt at 60, Darwin Street, Blackburn. Directors: H. W. Holt and Mrs. Dorothy Holt. Regd. office: 60, Darwen Street, Blackburn.

J. J. Store & Co., Ltd.—Registered 21st March. Capital £13,000. Manufacturers of, dealers in and agents for the sale and service of electrical fittings and appliances, radio, television, refrigerator and cold storage machinery, etc. Directors: J. J. Store and G. E. Coates. Regd. office: 76/8, Avenue Road, Southampton.

P. Traynor & Co., Ltd.—Registered in Dublin 25th February. Capital £3,000. Electricians, electrical engineers and contractors, radio and television engineers, etc. Directors: P. J. Walsh, St. Brendan's, Templeogue, K. J. Walsh, St. Rita, Firhouse Road, Templeogue, Co. Dublin, and P. Traynor, 3, Charlemont Gardens, off Charlemont Street, Dublin.

Bankruptcy

H. F. Thorrington, Eydon, Northants, electrical contractor.—Receiving order made 16th April on debtor's own petition.

NEXT WEEK'S EVENTS

Monday, 4th May

BIRMINGHAM.—James Watt Institute, Great Charles Street, 6 p.m. I.E.E. South Midland Centre. "Telemetering for System Operation," by R. H. Dunn and C. H. Chambers.

LONDON.—Burlington House, 5.30 p.m. Society of Engineers. "Gas Turbines in Retrospect and Prospect," by W. E. P. Johnson.

Tuesday, 5th May

GLASGOW.—39, Elmbank Crescent, 7 p.m. I.E.E. South-West Scotland Sub-Centre. Annual general meeting. Scottish Centre chairman's address, by T. S. A. Primrose.

HAMMERSMITH.—Windsor Castle Hotel, 134, King Street, W.6, 7.30 p.m. A.S.E.E. West London Branch. "Pattern for Progress," by Mr. Huxley.

LEEDS.—1, Whitehall Road, 6.30 p.m. I.E.E. North Midland Centre. Annual general meeting, and lecture by Prof. W. T. Astbury.

Great Northern Hotel, 7 p.m. A.S.E.E. Leeds Branch. "Brains Trust."

MANCHESTER.—Engineers' Club, Albert Square, 6.15 p.m. I.E.E. North-Western Centre. Annual general meeting. "Design Features of Certain British Power Stations," by S. D. Whetman and A. E. Powell.

Wednesday, 6th May

BIRMINGHAM.—James Watt Institute, Great Charles Street, 7 p.m. Junior Institution of Engineers, Midland Section. "Some Notes on the Technique of Casting Aluminium Billets by the Semi-Continuous Process," by E. Mitcheson.

CARDIFF.—At the South Wales Institute of Engineers, Park Place, 7.15 p.m. Incorporated Plant Engineers, South Wales Branch. "Modern Electrical Control Systems."

EDINBURGH.—Heriot-Watt College, 7 p.m. I.E.E. South-East Scotland Sub-Centre. Annual general meeting.

Incorporated Plant Engineers, Edinburgh Branch. Visit to Portobello power station.

LONDON.—I.E.E. London Students' Section. 2.15 p.m. Visit to Tate & Lyle, Ltd., Plaistow Refinery, Silvertown, E.16.

School of Hygiene & Tropical Medicine, Keppel Street, W.C.1, 6.30 p.m. British Institution of Radio Engineers, London Section. "Recent Advances in the Application of Electronics to Chemical Instrumentation," by G. I. Hitchcox.

PRESTON.—Harris Institute, Corporation Street, 7 p.m. I.E.E. North Lancashire Sub-Centre. Annual general meeting, "The Nervous System as a Communication Network," by J. A. V. Bates.

SOUTHAMPTON.—Polygon Hotel, 7.30 p.m. Incorporated Plant Engineers, Southampton Branch. "Pumps and Pumping," by J. B. Scivier.

Thursday, 7th May

LIVERPOOL.—Electricity Board's Service Centre, Whitechapel, 6.45 p.m. British Institution of Radio Engineers, Merseyside Section. Annual general meeting. "The Development of Radio and Electronics Industry in India," by G. D. Clifford.

LONDON.—Savoy Place, 5.30 p.m. I.E.E. Utilization Section. "Research in the Electrical Manufacturing Industry," by L. J. Davies.

PETERBOROUGH.—Incorporated Plant Engineers, Peterborough Branch. Evening visit to Hotpoint Electric Appliance Co., Ltd., Celta Mills, Fletton.

SWANSEA.—Mackworth Hotel, High Street, 7.30 p.m. Purchasing Officers' Association, West Wales Group. Annual general meeting, followed by discussion on "Purchasing Problems."

Friday, 8th May

CREWE.—Royal Hotel, Nantwich Road, 7.30 p.m. A.S.E.E. Crewe Branch. "High Voltage Switchgear and Protection," by Mr. Fawthrop.

LONDON.—At the Institution of Electrical Engineers, Savoy Place, W.C.2, 7 p.m. Institute of X-Ray Technology. "Is Super-Voltage of Therapy Really Necessary?" by G. S. Innes.

Feathers Hotel, Westminster, S.W.1, 6 p.m. Electrical Trades Commercial Travellers' Association. General meeting.

SOUTHAMPTON.—Polygon Hotel, 7.15 p.m. Purchasing Officers' Association, South of England Branch. Films: "This is Aluminium," "The Aluminium Boat" and "The Argon Arc Welding Process (Kodachrome)."

Saturday, 9th May

LEEDS.—1, Whitehall Road, 2.30 p.m. I.E.E. North Midland Students' Section. Annual general meeting.

LONDON.—North Hall Suite, Victoria Halls, Bloomsbury Square, W.C.1, 7.30 p.m. I.E.E. London Students' Section. Spring dance.

British Association

Liverpool Meeting Programme

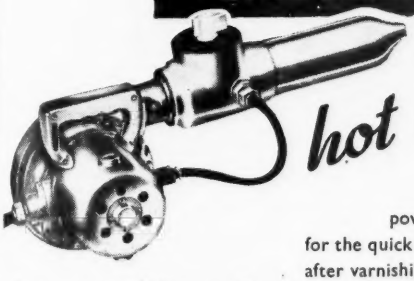
THE preliminary programme for this year's meeting of the British Association for the Advancement of Science at Liverpool (2nd to 9th September), together with registration and travel reservation forms, is now available from the secretary at Burlington House, Piccadilly, London, W.1. The full programme giving detailed arrangements will be published during the week ending 8th August and will be sent to all who indicate their intention of attending the meeting.

The inaugural meeting will take place in the Philharmonic Hall, Hope Street, on the evening of Wednesday, 2nd September, when the president, Sir Edward Appleton, G.B.E., K.C.B., F.R.S., will deliver his address on "Science for its Own Sake." This meeting will be preceded in the same hall by a special graduation ceremony. Sir Edward will also deliver a presidential address for student members on Thursday, 3rd September, when he will speak on "Finding Things out with Radio and Rockets."

Two evening discourses will be delivered on 4th September. Sir Harold Spencer-Jones will speak on "Continuous Creation" and on 7th September Mr. Eric Shipton will give a lecture entitled "Everest." The president of Section G—Engineering—is the Rt. Hon. Lord Dudley Gordon and of Section A—Mathematics and Physics—Professor Sir H. Jeffreys, F.R.S., whose address will be entitled "Applied Mathematics."

A large number of excursions, tours and visits to places of interest in the Liverpool region have been arranged, together with the usual complement of social functions.

MARTINDALE



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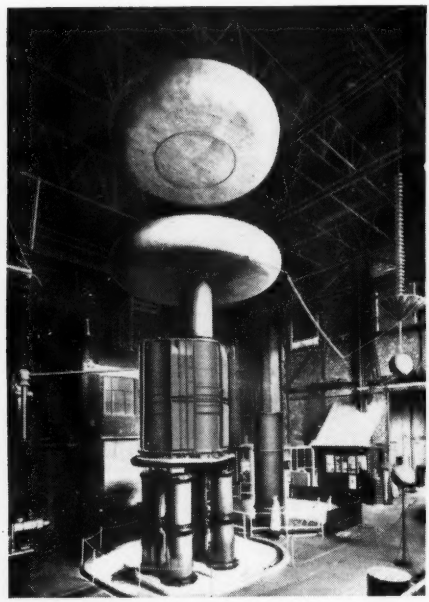

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NEW PATENTS

Electrical Specifications Recently Published

The numbers under which the specifications will be printed and abridged are given in parentheses. Copies of any specification (2s 8d each including postage) will be obtainable after 10th June from the Patent Office, 25, Southampton Buildings, London, W.C.2.

1946

2988. Marconi's Wireless Telegraph Co., Ltd.—Tuning means for ultra-high-frequency apparatus. 30th January, 1946. (692541.)

1947

31137. Heathcote, C. A. V.—Radio aerials. 13th December, 1948. (692692.)

1948

208. Philips Electrical, Ltd., Holmes, T., and Sell, E. A. —Vapour-discharge lamps. 4th April, 1949. (692693.)

10954. White, E. L. C.—Non-linear electrical circuits. 5th April, 1949. (692543.)

13821. Johnson & Phillips, Ltd., Aldridge, F. J., and Jones, H. S.—Jointing electric cables. 31st March, 1949. (692695.)

14775. Director of the Office of Technical Services, Department of Commerce.—Printed circuits. 1st June, 1948. (692694.)

25195. Philips Electrical, Ltd., and Odell, L. F.—Radio receiving systems. 7th September, 1950. (692472.)

28193. Marconi's Wireless Telegraph Co., Ltd.—Push-button mechanisms. 30th January, 1946. Divided out of 692541. (692544.)

1949

9769. Philips Electrical, Ltd.—Electric discharge tubes embodying electron mirrors. 11th April, 1949. (692697.)

11982. Automatic Telephone & Electric Co., Ltd.—Electrical signalling systems. 11th April, 1950. (692476.)

19159. Compagnie Générale de télégraphie sans Fil.—Velocity-modulated valves. 20th July, 1949. (692699.)

23178. Neill, H. J. (Graham Manufacturing Corporation).—Electric welding systems. 7th September, 1949. (692553.)

23324. Hunt, Ltd., A. H.—Metallization of the surfaces of dielectric material. 8th September, 1950. (692614.)

26739. British Thomson-Houston Co., Ltd.—Starting circuits for electric discharge devices. 18th October, 1949. (692702.)

27132. Metropolitan-Vickers Electrical Co., Ltd.—Devices for examining waveforms. 12th October, 1950. (692615.)

28728/9. Graham Manufacturing Corporation.—Electric welding apparatus. 9th November, 1949. (692558/9.)

31987. British Thomson-Houston Co., Ltd.—Methods of and apparatus for applying electron emission material to electrodes. 13th December, 1949. (692479.)

32919. Naamlooze Vennootschap Philips' Gloeilampenfabrieken.—Hot-gas reciprocating engines, or refrigerating engines or heat pumps operating on the reversed hot-gas reciprocating engine principle. 23rd December, 1949. (692564.)

1950

110. Du Pont de Nemours & Co., E. I.—Insulated electrical conductor and process of producing same. 3rd January, 1950. (692480.)

3792. Campagnie Générale de Télégraphie sans Fil.—Ultra-high-frequency amplifying tubes. 14th February, 1950. (692705.)

5923. British Dielectric Research, Ltd.—Manufacture of thin sheets or plates of heat-treated material suitable for the dielectrics of capacitors and for other purposes. 8th March, 1951. (692620.)

6219. Western Electric Co., Inc.—Electrostrictive ceramics and transducers utilizing them. 13th March, 1950. (692706.)

7754/5. Parmiter, Hope & Sugden, Ltd.—Fusible electrical cut-out assemblies. 9th March, 1951. (692621/2.)

8889. Power Centre Co., Ltd.—Tapping means for electric cables contained in trunking. 4th April, 1951. (692707.)

11067. Radio Corporation of America.—Gas rectifier tube employing magnetic field. 4th May, 1950. (692714.)

14557. Joens, W., and Joens, L. (trading as Joens & Co., W. H.)—Switch mechanism for electrical supervision or control equipment. 12th June, 1950. (692716.)

15023. Ferranti, Ltd.—Methods of manufacturing gas-tight vessels. 18th June, 1951. (692718.)

15183. Electric & Musical Industries, Ltd.—Radio antennas. 13th June, 1951. (692719.)

17144. Davis & Son, Derby, Ltd., J., and Davis, W. H. —Signalling transformer apparatus for use in dangerous atmospheres. 10th October, 1951. (692625.)

18411. Standard Telephones & Cables, Ltd.—Electrical remote control and supervisory systems. 20th July, 1951. (692721.)

18984. Ashley Accessories Ltd.—Dolly-operated electric switches. 27th July, 1951. (692626.)

20026. Cox, J. E.—Electric fuses. 19th July, 1951. (692627.)

20416. Crabtree & Co., Ltd., J. A., and Morgan, R. W. —Ceiling-mounted electrical wiring boxes. 16th August, 1951. (692724.)

20536. General Electric Co., Ltd., and Dale, S. H.—Circuit arrangements for detecting reverse current in vapour arc converters. 6th December, 1951. (692494.)

21864. English Electric Co., Ltd.—Oil filter arrangements for stationarily mounted turbo-generator plant. 24th August, 1951. (692497.)

21989. Morgan Crucible Co., Ltd.—Submerged resistor induction furnace. 4th September, 1951. (692498.)

23191. General Electric Co., Ltd., Curtis, P. B., and Smith, R.—High-frequency electric induction heating apparatus. 21st September, 1951. (692501.)

24116. Crabtree & Co., Ltd., J. A., and Hill, W. E.—Locking means for handle-operated electric switches. 1st October, 1951. (692503.)

24958. General Electric Co., Ltd., and Pickering, L. J. —Welding apparatus and welding systems. 20th September, 1951. (692725.)

25761. Technical Assets, Inc.—Electrochemical apparatus incorporating mobile electrodes immersed in a liquid medium. 9th October, 1951. Cognate application 26270, 27th October, 1950. (692504.)

27047. Welding Research, Inc.—Conversion of polyphase alternating current into unidirectional current impulses. 6th November, 1950. (692505.)

27828. General Electric Co., Ltd., and Croft, E. H.—Electric surge arrestor arrangements. 20th September, 1951. (692728.)

28135. Allmanna Svenska Elektriska Aktiebolag.—Electric lighting systems for vehicles. 17th November, 1950. (692508.)

29915. Yardeny International Corporation.—Electrodes for secondary electric batteries. 6th December, 1950. (692731.)

30308. Westinghouse Brake & Signal Co., Ltd., and Walker, A. H. B.—Cooling arrangements for electrical apparatus. 25th September, 1951. (692510.)

31131. British Thomson-Houston Co., Ltd.—Wave guide attenuator. 14th December, 1951. (692591.)

31226. Metropolitan-Vickers Electrical Co., Ltd.—Electrical pulse generating circuit arrangements. 11th December, 1951. (692733.)

1951

831. Associated Electrical Industries, Ltd.—Construction of contact rectifiers. 2nd January, 1952. (692593.)

2694. Quasi-Arc Co., Ltd., and Barber, B. K.—Electrodes for arc welding. 18th January, 1952. (692650.)

2825. Lyons, W.—Voltage-stabilizing apparatus. 5th March, 1952. (692652.)

4978. Monsanto Chemical Co.—Electric furnaces and methods of operating same. 1st March, 1951. (692710.)

6116. Electrical & Auto Products (1931), Ltd., and Rothwell, G. A.—Electrical testing apparatus. 14th March, 1952. (692659.)

6502. International Research & Development Corporation.—Magnetic recording and reproducing apparatus. 19th March, 1951. (692661.)

8058. Akt.-Ges. Brown, Boveri & Cie.—Diaphragm for screening röntgen rays. 6th April, 1951. (692522.)

8751. General Motors Corporation.—Rotors for turbines or compressors. 16th April, 1951. (692524.)

10478. Schuhfried, F.—Device for generating electrical impulses alternately in two electrical circuits by the use of electronic valves. 4th May, 1951. (692667.)

12235. Klangfilm Ges.—Arrangements for automatic amplitude regulation, especially dynamic regulation, in an electric transmission system. 24th May, 1951. (692526.)

12791. Siemens & Halske Akt.-Ges.—Corpuscular ray apparatus. 30th May, 1951. (692751.)

13777. Chloride Electrical Storage Co., Ltd.—Securing of electric accumulators in containers. 12th March, 1952. (692670.)

14102. Allis-Chalmers Manufacturing Co.—Electric circuit interrupter having arc extinguishing means. 14th June, 1951. (692752.)

14523. British Thomson-Houston Co., Ltd.—Packaging of small articles. 6th March, 1952. (692673.)

17486. Philips Electrical Industries, Ltd.—Circuits for selector switches. 24th July, 1951. (692531.)

18780. British Thomson-Houston Co., Ltd.—Tuning systems. 9th August, 1951. (692757.)

20798. Levy, M.—Automatically and manually operable electric fire alarm switches. 3rd September, 1951. (692605.)

21167. Standard Telephones & Cables, Ltd.—Electric frequency converting circuit employing regenerative modulation. 7th September, 1951. (692533.)

26771. Philips Electrical Industries, Ltd.—Methods of sealing an iron cone to a glass window and cathode-ray tubes manufactured by these methods. 15th November, 1951. (692765.)

28889. British Thomson-Houston Co., Ltd.—Methods of making electric capacitors. 10th December, 1951. (692608.)

29482. British Thomson-Houston Co., Ltd.—Rotors for dynamo-electric machines. 17th December, 1951. (692538.)

1952

346. Standard Telephones & Cables, Ltd.—Tuning device for communication equipment. 4th January, 1952. (692684.)

5452. Welwyn Electric Laboratories, Ltd.—Fluid-cooled resistors. 3rd March, 1952. (692688.)

5994. Philips Electrical Industries, Ltd.—Television receivers. 7th March, 1952. (692769.)

6737. Standard Telephones & Cables, Ltd.—Locking in its mounting of the cathode of an indirectly heated valve. 14th March, 1952. (692770.)

TRADE MARKS

APPLICATIONS have been made for the registration of the following trade marks. Objections may be entered up to 15th May.

SPEEDMOR. No. B713,984. Class 7. Electric motors for use with sewing machines.—Hillman Electric Motors, Ltd., 2-3, Northwold Buildings, Northwold Road, Stoke Newington, London, N.16.

No. 706,204 (design). Class 9. Electric batteries, battery cables, ignition cables and electric fuses. No. 706,205 (design). Class 11. Electric light bulbs, bulbs for electric torches, and oil filters (not for scientific purposes and not being parts of engines, of motors or of machines).—Socony-Vacuum Oil Co., Inc., New York, U.S.A. Address for service, c/o Mathys & Squire, 52, Chancery Lane, London, W.C.2.

GLOVAC. No. 710,993. Class 9. Fluorescent lamp starter switches; and neon discharge lamps, being indicator lamps for electrical apparatus.—Manifold Electric Co., Ltd., 124, St. Margarets Road, Twickenham, Middlesex.

MINIATRON. No. 711,864. Class 9. Electronic discharge tubes (not for lighting purposes).—Société Française Radio-Electrique, Paris, France. Address for service, c/o Haseltine, Lake & Co., 28, Southampton Buildings, Chancery Lane, London, W.C.2.

No. B713,521 (design). Class 9. Electric batteries.—Union Carbide & Carbon Corporation, New York, U.S.A. Address for service, c/o Marks & Clerk, 57 and 58, Lincoln's Inn Fields, London, W.C.2.

VULCAN-O. No. 712,966. Class 11. Electrical air-conditioning and air-disinfecting appliances, and parts thereof included in Class 11; and electrically actuated devices for destroying insects and their larvæ and eggs by fumigation.—The Vulcan Fumigator Co., Ltd., Canada House, Norfolk Street, London, W.C.2.

CREDA QUEEN. No. 714,894. CREDA COMMODORE. No. 715,016. Class 11. Electric cooking stoves and electric ovens.—Simplex Electric Co. Ltd., Broadwell, Oldbury, near Birmingham.

BOOKS RECOMMENDED BY

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CONTRACT INFORMATION

Accepted Tenders and Prospective Electrical Work

CONTRACTS OPEN

Where "Contracts Open" are advertised in our "Official Notices" section the date of the issue is given in parentheses.

Australia. — 12th May. Commonwealth Department of Civil Aviation. Supply of high and low intensity runway lighting fittings. (C.R.E. 11719/53. Ten/6185.)*

BRISBANE.—1st July. State Electricity Commission. Supply of nineteen transformers and twenty relays. (C.R.E. 13865/53. Ten/6184.)*

Ayr.—County Council. Street lighting equipment. (See this issue.)

Belfast.—22nd May. Electricity Department. Private automatic telephone exchange equipment. (See this issue.)

Blackpool.—16th May. Corporation Electrical Service Department. Street lighting equipment. (See this issue.)

Chadderton. — 9th May. U.D.C. Street lighting equipment. Surveyor, Town Hall.

Durham.—County Council. Electrical installations at the new Wheatley Hill ambulance depot, and Peterlee fire station. County architect, Court Lane, Durham.

Edinburgh.—North of Scotland Hydro-Electric Board. Erection of h.v. and l.v. lines in Banffshire. (See this issue.)

Galashiels. — 25th May. Town Council. Street lighting equipment. (See this issue.)

India.—NEW DELHI.—26th May. Director General Supplies and Disposals. Supply of underground telephone cables. (C.R.E. 13999/53. Ten/6201.)* 3rd June. One 60 kW generating set. (C.R.E. 14186/53. Ten/6223.)*

Irish Republic. — DUBLIN. — 12th May. County Council. Two electrically-driven pumping units. (C.R.E. 13891/53. Ten/6187.)*

Leeds.—11th May. Transport Committee. Telephone cable and l.v. cable. (See this issue.)

Mitcham.—23rd May. Corporation. Street lighting equipment. (See this issue.)

Portuguese East Africa. — BEIRA. — 2nd May. Treasury Stores Department. Supply of three diesel engines with 5.5 kVA generators, etc. (C.R.E. 13670/53. Ten/6188.)*

South Africa.—DURBAN.—15th May. Corporation. Switchboard spares, wire and waxed twine. (C.R.E. 13826/53. Ten/6192.)*

Tangier.—2nd May. Electricity and Water Board. Electrical equipment for a 5,500 V transformer station at Rue de Portugal. (C.R.E. 12515/53. Ten/6182.)* Electrical equipment for a 5,500 V transformer station at the Stade Municipal. (C.R.E. 12639/53. Ten/6183.)*

United States.—SEATTLE.—15th May. Corps of Engineers, U.S. Army. Two 3,000 kVA station service generators for the Chief Joseph Dam. (C.R.E. 14662/53. Ten/6227.)* 5th June. Supply of 480 V main dam switchgear for the Chief Joseph Dam. (C.R.E. 14608/53. Ten/6228.)*

ORDERS PLACED

Coventry.—Education Committee. Electrical work at Caludon Castle School (£4,839).—Electrical Installations, Ltd.

London.—L.C.C. Electrical installations in schools: Hotham Primary School, Wandsworth (£3,794) and Ballamore Primary School, Lewisham (£3,322).—Thorpe & Thorpe, Ltd.

KENSINGTON. — Borough Council. Recommended. Two lifts to serve 32 flats at Holland Street (£4,454).—Waygood Otis, Ltd.

Rotherham.—Transport Committee. Recommended. Four miles of trolley wire (£1,785).—British Insulated Callender's Cables, Ltd.

Swindon.—Corporation. Recommended. Rewiring work at Jennings Street School (£915).—W. J. Moran.

WORK IN PROSPECT

Particulars of new works and building schemes for the use of electrical installation contractors and traders. Publication in this section is no guarantee that electrical work is definitely included. Alleged inaccuracies should be reported to the Editors.

Abingdon.—Sewage pumping station and works for R.D.C.; Ruddock & Meigham, Ltd., contractors, Burford House, Wealdstone.

Bungalows (46) at Dean Court, Botley; surveyor, Rural Council Offices, 60, Bath Street.

Berwick-on-Tweed.—Houses (74); borough surveyor.

Birmingham.—Reconstruction of factory at Camden Street for Bulpitt & Sons, Ltd.; Philip Skelcher & Partners, architects, Lloyds Bank Chambers, Poplar Road, Solihull.

Brierley Hill.—Apprentices' training school (£35,000) for Richard Thomas & Baldwins, Ltd.; Webb & Gray, architects, Dudley.

Bristol. — Factory and offices, Brislington Trading Estate; Iron & Marble Co., Ltd., 33, Victoria Street.

Chatham. — Radiotherapy centre at St. William's Hospital, Rochester; South-East Metropolitan Regional Hospital Board, 27, Queen Anne Street, London, W.1.

*Specifications may be inspected at the Commercial Relations and Exports Department, Board of Trade, House Guards Avenue, Whitehall, S.W.1 (Trafalgar 8855).

Coventry. — Seven shops and additional dwellings at Manor House estate; Pite, Son & Fairweather, architects, 6, Queen Annes Gate, London, S.W.1.

Crawley. — Extension of omnibus garage; Southdown Motor Services, Ltd., County Oak.

Crosby. — Erection of St. Bede's R.C. Secondary School; John Williams (Liverpool), Ltd., Liverpool.

Cuckfield.—Houses (34), Hassocks; A. Hutchings, R.D.C. surveyor, Boltro Road, Haywards Heath, Sussex.

Dagenham. — Factory, Selinas Lane; Capworth Engineering Co., 126, Fanshawe Avenue, Barking.

Dewsbury.—Branch library, Dewsbury Moor; borough architect.

Droitwich. — Secondary modern school, Witton; L. C. Lomas, architect, 14, Castle Street, Worcester.

Dukinfield.—Shops and flats in Birch Lane; borough engineer, Town Hall, Dukinfield, Ashton.

Eccles.—Flats (118), Church Street site; F. Bradley, architect, 1, Whitegates, Mottram.

Enfield.—New swimming baths proposed on site at College Farm (£150,000); F. Lee, U.D.C. surveyor, 7, Little Park Gardens.

Eston.—Houses (140) on the Crossbeck and Redcar Road East estates for U.D.C.; N. C. Harrison, surveyor, South Bank-on-Tees.

Farnham. — Houses (42), Weydon Lane; Gilbert & Hobson, architects, 75, Castle Street.

Golborne.—Houses (32) and bungalows (10), Hampson estate; U.D.C. surveyor.

Harpenden.—Eight shops and maisonettes, Batwell estate; U.D.C. surveyor.

Hounslow.—Rebuilding war destroyed Holy Trinity Church, High Street; Walter E. Cross, architect, The Studio, Osterley Road, Isleworth.

Kirton (Lincs).—County secondary modern school; county architect, Boston.

Leamington Spa. — Factories, Kingsway Trading Estate; J. Trelawny, Ltd., 54, Holly Walk and Ludwell & Co., Ltd., Gordon Street, Coventry.

Leicester.—Houses (692) and three-storey flats at Abbey Lane, Thurcaston Road, Scraptoft, Coleman Road, Braunstone Avenue and on the Eyres Monsell estate; city architect.

Liverpool.—Proposed new hospital at Greaves Hall, Banks (£990,000); Regional architect to the Hospital Board, 88, Church Street.

London.—HOXTON.—Factory premises, Chart Street; Stock, Page & Stock, architects, Fanshawe House, Fanshawe Street, N.1.

LEWISHAM.—The project for a new community centre is being dealt with by the borough architect, Mr. M. H. Forward, not by the borough engineer as stated in our issue of 17th April.

SOUTHWARK.—Two blocks of flats, Lancaster Street; H. Fairweather & Co., Ltd., builders, St. James's Lane, N.10.

Loughborough. — One-form entry school, Thorpe Acre estate (1954-55 programme); county architect, Leicester.

Lowestoft. — Cold storage premises for Herring Industries, Ltd.; W. Ames, Ltd., builders, Dene Side, Great Yarmouth.

Malling (Kent).—Houses (91), on site in Borough Green; surveyor, Rural Council Offices, West Malling, near Maidstone.

Mansfield.—Development of Brick Kiln Lane estate, with provision for 450 houses, etc., and shops; borough surveyor, Carr Bank.

Shops (10), Ladybrook estate; borough surveyor.

Newcastle-on-Tyne.—Conversion of house at Jesmond into old people's home (£12,000); county architect, County Hall, Newcastle.

Salford. — Extensions to central garage, Ordsall Lane; city engineer, Town Hall.

Smethwick.—New spring works in Spon Lane; George Salter & Co., Ltd., West Bromwich.

Southampton.—Dairy, Shirley Road; Southampton Co-operative Society, Ltd., 122, St. Mary's Road.

Southend-on-Sea.—Factory, Bircham Road; Slix, Ltd., 47, Maddox Street, London, W.1.

Stanley (Co. Durham). — Old people's bungalows at Tanfield Lea; U.D.C. surveyor.

Stanwell.—Houses (192) for B.O.A.C. Staff Housing Society; F. Greenwood, surveyor, 25, Liverpool Road, Kingston-on-Thames.

Stretford.—Flats (57), Milton Close estate; Humphrey Park Estates, Ltd., Humphrey Lane, Urmston.

Sunderland.—Extensions to factory; Bristol Aeroplane Co., Bristol.

Conversion of tram sheds in Hylton Road into bus depot (£32,680); borough engineer.

Swansea.—Showrooms and offices, Princess Way; Staverton Builders, Ltd., Staverton Bridge Mills, Totnes.

Totnes. — Houses (22), Pathfields estate; J. Smith, borough surveyor, Municipal Offices.

Twickenham.—Three-storey flats in Broad Lane, Hampton; A. S. Knolles, borough surveyor, Municipal Offices.

Tyldesley.—Houses (38), Shakerley estate; R. F. Wilson, clerk to U.D.C., Town Hall.

Wakefield.—Houses (118), Eastmoor, and shops and flats on the Kettlethorpe and Eastmoor Estates; city engineer, Room 33, Town Hall.

Wallsend.—Houses (18), Denbigh Avenue, for the North Heaton Development Co.; Lamb & Edge, architects, 36 Blackett Street, Newcastle-on-Tyne.

Walsall. — Factory at Garden Street, Wisemore; Dainty, Ltd., Leighswood Avenue, Aldridge, Staffs.

Wigan.—Factory for Turner Bros. Asbestos, Ltd.; Ashworth & Fletcher, architects, Yorkshire Street, Rochdale.

Woodford Green.—Flats (56), and community hall (500 places), at Broomhill Road, for B.C.; A. McCarlie Findlay, town clerk, Municipal Offices, High Road, South Woodford, E.18.

York.—Rebuilding war damaged portion of the Guildhall; city architect.